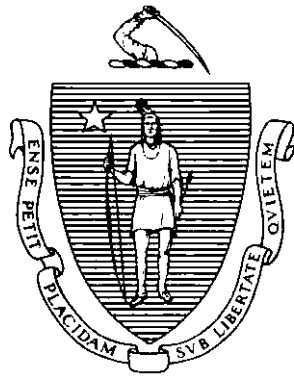


**THE COMMONWEALTH OF MASSACHUSETTS  
PUBLIC EMPLOYEE RETIREMENT ADMINISTRATION**



**INVESTMENT REPORT  
MASSACHUSETTS CONTRIBUTORY RETIREMENT  
SYSTEMS FOR PUBLIC EMPLOYEES  
DECEMBER 31, 1987**

**MICHAEL S. DUKAKIS**  
Governor

**FRANK T. KEEFE**  
Secretary of Administration  
and Finance

**JOHN J. McGLYNN**  
Commissioner  
Public Employee Retirement Administration

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS  
FOR PUBLIC EMPLOYEES

INVESTMENT REPORT

December 31, 1984 through December 31, 1987

PERA is proud to present this third Annual Report on the investment activity of the Massachusetts Contributory Retirement Systems. This is the earliest date on which the report has been released due to a special effort made by PERA in the wake of the unprecedented events which took place in the financial markets during 1987. Recognizing how important this information is to the boards, public officials and taxpayers, PERA's Pension Investment Advisory Unit, under the direction of Lisa R. Reibstein, worked long and hard to insure that accurate performance figures would be released in a timely fashion.

Throughout the last several years, in our reports as well as in other contacts with boards, advisors, Legislators and others, we have stressed that investment performance can only be fairly and accurately analyzed over long time periods. In light of the dramatic events of last fall, this caveat is most appropriate. Because the Massachusetts Contributory Retirement Systems are pension funds with liabilities coming due over long timeframes, they are by their very nature, long-term investors. Consequently, the investment performance attained over several years is a more accurate measure of success or failure than that attained in a single year or quarter. However, we must also recognize that this is the third year in which PERA has completed this investment review. As the data becomes available for longer periods, obviously conclusions will be drawn regarding the relative performance of the retirement systems.

The year 1987 was a challenging one for all of those involved in investments, from the multi-billion dollar money manager to the individual investor. As you will see, this report provides ample evidence that the Massachusetts Contributory Retirement Systems in general met that challenge.

In recent years, as the investment options available to retirement systems under Chapter 32 have become more varied, the financial marketplace itself has undergone dramatic changes. Modern communication networks have integrated markets worldwide giving the investor more places in which to commit assets. Similarly, computerized trading enables orders to be filled instantaneously. Finally, new investment techniques, such as portfolio insurance, provide investors with sometimes confusing products and strategies from which to choose. All of these factors played an active role in the market of 1987.

The first quarter of 1987 saw a continuation of the long bull market which began in August of 1982. However, the early part of the year brought about a basic change in the nature of that bull market. Over the course of the four and one half years in which the market was moving steadily upward, the bond and stock markets moved in tandem, however, as interest rates rose, the bond market fell while the stock market achieved new highs. The stock market was no longer driven by lower interest rates but by higher corporate earnings. Also, stocks were aided by a continued inflow of foreign capital as well as the increased liquidity resulting from tax-related selling in late 1986.

In August, the bull market reached its fifth anniversary. The Dow Jones had, over that time, gained 241%, and had, since the beginning of the year, gained 42%. In the third quarter, share prices continued upward as institutional investors committed reserves to equities to avoid being shut out of the next market uptick. Finally, in October, the market reacted to economic fundamentals which seemed to conflict with the rising price of shares. Rising interest rates, a weak bond market, a falling dollar, and the trade and budget deficits reined in the bulls. Worries about these issues initiated waves of selling in October, climaxing on October 19. In one day, the Dow Jones lost 508 points (22.6%). The fall in prices was exacerbated by index arbitrage-related computer program trading.

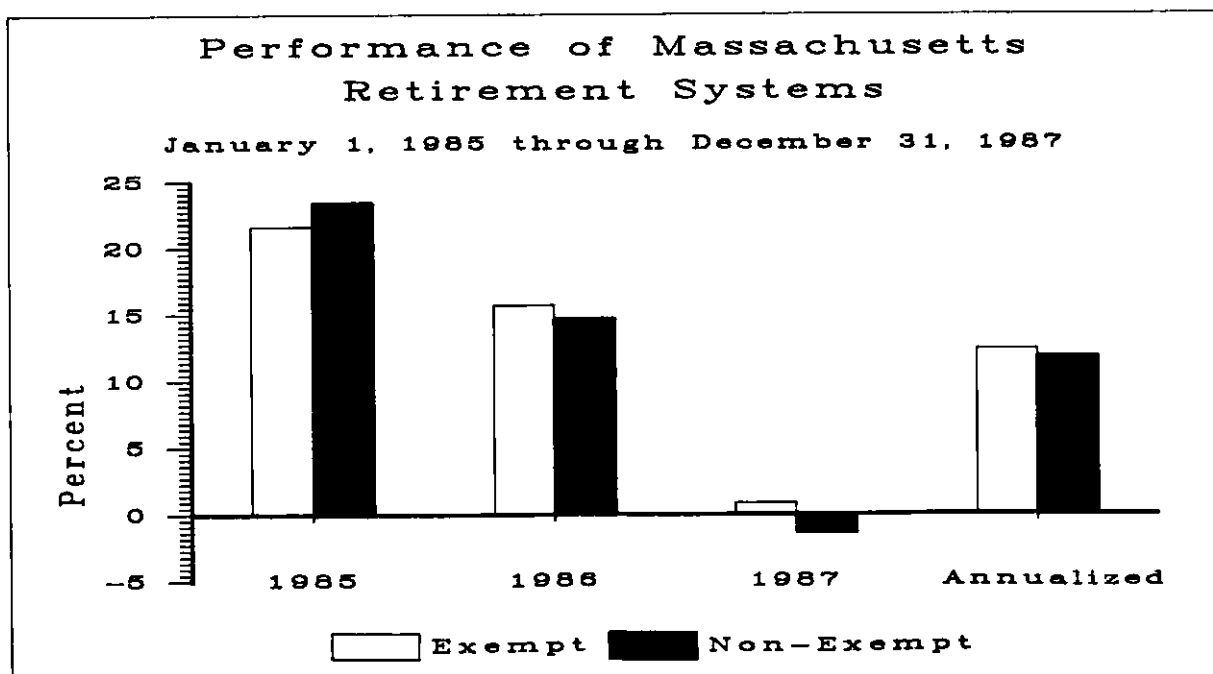
Despite the chaotic fourth quarter, most equity indices realized gains in 1987. The Dow Jones ended the year with market values up 2.3%. Thus, in the final analysis, the fourth quarter of 1987, and more particularly the sharp slide of October, basically gave back the gains which had been achieved during the earlier part of the year when the market was as extraordinary on the upside as it was later on the downside. Not all groups were affected in the same way by this volatility. The NASDAQ Composite Index which measures the performance of the stock of the smaller capitalization companies, fell by 5.26%. In addition, equity returns by industry varied greatly. The steel industry had the largest increase in market value, with an average increase of 69%. The metals and mining industry's market value increased by 63% and semi-conductor manufacturers' by 39%. In contrast, the major losers of 1987 were bank stocks. Generally, whether the particular institution was large or small, negative

results prevailed. On average, the banking industry market value fell 16%. The Keefe, Bruyette & Woods Index for money center banks had a total return of -13.88%. The market value in the savings & loan industry declined an average of 30%. This data shows that although the overall stock market provided a positive return, despite the experience of October, an investor who was concentrated in certain areas risked negative performance in 1987.

In all of the excitement about the equity markets in 1987, we cannot lose sight of the fact that our retirement system portfolios include fixed income and other asset classes. The total return for a system is a product of the return for each individual class. The success with which a system distributes its assets among investment categories plays a leading role in determining investment outcome. Although public attention was riveted on the stock market, stocks overall, as we have seen, enjoyed modest gains in 1987, while fixed income results were mixed at best. The Shearson Lehman Government/Corporate Bond Index returned 2.30% while the Salomon Brothers High-Grade Long-Term Bond Index fell by .27%.

Nineteen eighty-seven represented a test of the statutory reforms enacted in 1984, which provided greater flexibility in the investment area to retirement boards. Boards were granted the option to retain management of assets, select outside advisors, or join the Pension Reserve Investment Trust Fund. The results since 1985, particularly those of 1987, confirm the wisdom of this approach. In that three-year period, 80 of the 107 systems had annualized returns of 10% or higher, while only 3 systems had returns below 7.45%. As a result, investment activities have contributed to asset growth which will ultimately offset pension costs.

In assessing the performance of the systems in 1987 several matters should be noted. It appears that, with several exceptions, systems which have chosen the waiver or PRIT option did better than those systems which have elected to invest according to the statutory legal list outlined in Chapter 32. The diversification by these non-legal list systems enabled them to avoid concentration in areas which suffered severe losses in 1987. This diversification, combined with greater overall exposure to the equity class, which performed better than fixed income, is largely responsible for this comparative performance. In addition, the 1987 results confirm what we saw in 1986, when the 79 non-legal list systems outperformed the 27 legal list systems by 102 basis points, 15.71% to 14.69%, respectively. In 1987, the 82 non-legal list systems outperformed the 24 legal list systems by 219 basis points, .85% to -1.34%, respectively. This is also borne out by the annualized return for the 1985 - 1987 period which shows that non-legal list systems have outperformed legal list systems by 61 basis points, 12.38% to 11.77%, respectively. This data provides clear evidence that the actions of the Governor and the Legislature in adopting Chapter 66I and in supporting its implementation have brought about gains in investment performance. Perhaps most importantly, the reform of our retirement investment law gave the systems the tools to avoid substantial losses in the dangerous investment environment of 1987.



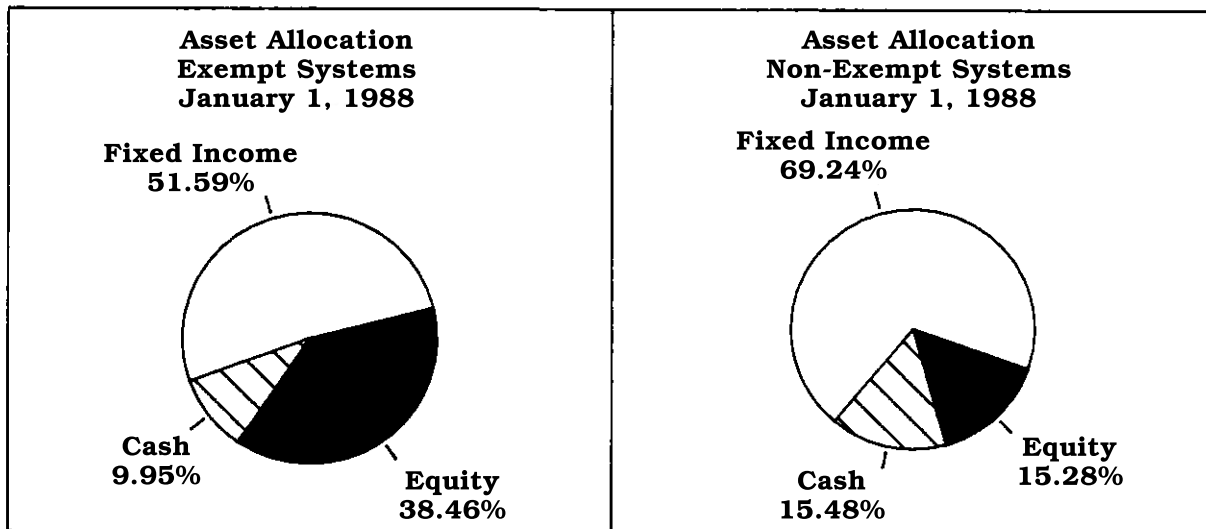
## Diversification

"There is a close logical connection between the concept of safety margin and the principle of diversification. One is correlative with the other. Even with a margin in the investor's favor, an individual security may work out badly. For the margin guarantees only that he has a better chance for profit than for loss - not that loss is impossible. But as the number of such commitments is increased the more certain does it become that the aggregate of the profits will exceed the aggregate of the losses."

The Intelligent Investor  
Benjamin Graham

A consistent theme of PERA's Investment Advisory Unit has been the importance of diversifying system investments. In our 1986 report we cited asset allocation as the most important investment decision made by a board. Through careful investment planning and asset allocation a portfolio can be protected from extreme volatility of returns. Because Massachusetts retirement systems are long-term investors and also because investment losses must be offset by appropriation of taxpayer dollars, it is crucial that investments be diversified among the various asset classes and that further diversification take place within those asset classes. In this manner assets should provide a consistent return over long periods without suffering major losses. Diversification of investments is not only a component of prudent investment planning as it applies to the Massachusetts Retirement Boards, it is also an important element of the statutory fiduciary duty set forth in subdivision 3 of section 23 of Chapter 32:

A Fiduciary as defined in section one shall discharge his/her duties for the exclusive purpose of providing benefits to members and their beneficiaries with the care, skill, prudence and diligence under the circumstances then prevailing that a prudent person acting in a like capacity and familiar with such matters would use in the conduct of an enterprise of a like character and with like aims and by diversifying the investments of the system so as to minimize the risk of large losses unless under the circumstances it is clearly prudent not to do so.



The remainder of this report sets forth the performance figures and comparative statistics for the 106 Massachusetts Retirement Systems and the PRIT Fund. PERA would like to thank the members and employees of the Massachusetts Contributory Retirement Boards, and the investment advisors and custodian banks who serve the boards, for their cooperation in compiling this report. Without their assistance, it would have been impossible to provide this report, and we look forward to working with them to assure the timely release of future investment information.

Continued success in the implementation of the broad authority established by Chapter 66I will require continued oversight by PERA. Success will also require the involvement by retirement board members in the exercise of their fiduciary responsibilities which will insure the long-term interests of the 350,000 men and women whose financial future depends on the good judgement of the retirement board fiduciaries.

The Division of Public Employee Retirement Administration  
Pension Investment Advisory Unit

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS  
FOR PUBLIC EMPLOYEES

INVESTMENT REPORT

12/31/84 - 12/31/87

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MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS  
INVESTMENT REPORT

SYSTEM PERFORMANCE

Asset Value; Investment Management

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TABLE # 1

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System	1985-1987 Annualized Time-Weighted		1985 Time-Weighted		1986 Time-Weighted		1987 Time-Weighted		12/31/87 Market Value		Date of Waiver/ PRIT	Investment Manager(s)
	Rank	Return	Rank	Return	Rank	Return	Rank	Return	Rank	Value		
Mass Water	107	4.40	107		107	5.78	1	6.33	106	\$1,550,577	2/88	Boston Company
Taunton	3	16.26	33	23.41	5	20.06	2	6.06	42	\$20,259,015	6/85	U.S. Trust Company
Adams	24	13.25	14	26.32	102	9.14	3	5.37	97	\$3,510,690		
Braintree	10	14.58	36	22.89	21	16.40	4	5.17	43	\$19,525,107	4/85	* Drexel, Burnham, Lambert
Montague	94	9.04	102	13.27	101	9.16	5	4.86	103	\$2,287,386	3/86	* PRIM Board
Needham	8	14.76	78	19.58	4	20.75	6	4.67	40	\$20,649,485	3/85	* PRIM Board
Weymouth	1	17.16	6	28.18	6	20.02	7	4.53	45	\$18,890,749	10/84	PRIM Board
Minuteman	29	13.01	103	13.17	1	22.05	8	4.49	107	\$1,280,695	7/85	PRIM Board
Milton	38	12.40	43	22.54	82	10.94	9	4.46	59	\$12,733,886	7/86	PRIM Board
Shrewsbury	21	13.48	91	17.28	8	19.34	10	4.43	73	\$9,237,001	2/85	* PRIM Board
Wakefield	6	14.84	74	19.75	3	21.12	11	4.43	61	\$12,468,118	7/85	PRIM Board
Hampshire Co.	63	10.98	94	17.18	77	11.73	12	4.41	38	\$21,604,552	4/85	Bank of New England - West
Holyoke	4	15.01	9	27.87	45	14.15	13	4.22	28	\$31,540,486	12/85	* Multiple Advisors
Fairhaven	55	11.57	55	21.53	95	9.67	14	4.19	93	\$3,919,720	7/86	PRIM Board
Norfolk County	7	14.83	29	23.78	11	17.47	15	4.14	8	\$80,346,088	11/85	PRIM Board
Saugus	84	9.91	100	14.52	78	11.50	16	3.98	78	\$8,205,120	7/86	PRIM Board
Mass Port	9	14.65	50	22.17	9	18.68	17	3.93	13	\$54,681,573	2/85	Thorndike,Doran,Paine&Lewis
Northbridge	64	10.97	82	19.33	88	10.34	18	3.78	102	\$2,545,995	4/85	* PRIM Board
Lowell	35	12.61	67	20.22	43	14.50	19	3.74	24	\$35,025,515		*
Athol	67	10.95	71	19.91	94	9.82	20	3.72	101	\$2,798,124	6/85	Shawmut/Worcester County
Concord	77	10.24	96	16.77	86	10.67	21	3.68	75	\$8,639,466	5/86	* Multiple Advisors
Dedham	14	14.30	8	27.95	65	12.66	22	3.60	74	\$8,738,839	6/88	* PRIM Board
Webster	47	11.97	75	19.71	53	13.46	23	3.36	100	\$2,943,098		* Alex Brown
Prim Board	5	14.98	38	22.75	7	19.94	24	3.24	3	\$2,005,077,465	12/83	* Multiple Advisors
Wellesley	13	14.32	39	22.74	10	17.92	25	3.24	41	\$20,310,924	2/85	Standish, Ayer & Wood
Gardner	53	11.65	80	19.45	62	12.94	26	3.16	89	\$5,652,263	5/85	* PRIM Board
Mass Turnpike	15	13.94	42	22.68	13	16.90	27	3.15	18	\$44,200,488		
Arlington	28	13.06	68	20.13	18	16.65	28	3.12	29	\$30,179,679	3/85	Constitution Capital Mgmt.
Blue Hills	91	9.27	104	11.66	54	13.35	29	3.09	104	\$1,942,902	4/85	David L. Babson
Salem	41	12.12	79	19.46	41	14.58	30	2.98	37	\$21,729,236	4/85	Shawmut Bank of Boston
Haverhill	16	13.81	40	22.70	14	16.79	31	2.87	34	\$24,010,346	7/85	Boston Company
Norwood	68	10.93	95	17.18	56	13.30	32	2.82	39	\$20,909,747	3/85	* Constitution Capital Mgmt.
Framingham	54	11.63	81	19.37	49	13.57	33	2.62	30	\$25,858,464		*
Attleboro	57	11.52	73	19.87	63	12.91	34	2.47	68	\$10,717,963	4/85	BayBank Inc.
Leominster	60	11.21	77	19.64	73	12.22	35	2.46	65	\$11,205,985	4/85	First Safety Fund Natl Bank
Revere	99	8.71	101	14.44	96	9.65	36	2.39	46	\$17,059,862	5/85	* Fort Hill

\* Appendix 1 contains footnoted listings for Investment Managers, page 35.

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS  
INVESTMENT REPORT

SYSTEM PERFORMANCE

Asset Value; Investment Management

PAGE TWO

TABLE # 1

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System	1985-1987 Annualized		1985		1986		1987		12/31/87		Date of Waiver/ PRIT	Investment Manager(s)
	Rank	Return	Rank	Return	Rank	Return	Rank	Return	Rank	Value		
Stoneham	18	13.80	30	23.68	22	16.38	37	2.37	66	\$10,845,631	7/85	David L. Babson
Falmouth	71	10.82	88	18.36	71	12.41	38	2.30	82	\$7,264,434	4/85	State Street Bank
Melrose	31	12.95	58	21.15	20	16.49	39	2.11	60	\$12,644,134	4/85	Constitution Capital Mgmt.
Middlesex Co.	30	12.96	35	22.92	39	14.90	40	2.06	5	\$127,513,453	3/85	* Multiple Advisors
Hampden County	49	11.96	61	20.79	47	13.87	41	2.03	25	\$34,982,609	8/85	* Boston Company
Easthampton	42	12.05	60	20.95	46	14.06	42	1.99	92	\$4,059,837	4/85	Nrthmptn Inst. for Savings
Fall River	19	13.74	20	25.13	33	15.35	43	1.95	19	\$43,499,443	8/85	BayBank Inc.
State Employees	20	13.66	22	24.07	23	16.16	44	1.88	2	\$2,730,779,955	12/83	* Multiple Advisors
Methuen	56	11.54	70	20.03	51	13.50	45	1.86	67	\$10,839,103	10/86	* David L. Babson
Berkshire Co.	43	12.03	52	21.92	57	13.24	46	1.84	54	\$14,301,875		*
Worcester	44	12.02	83	19.26	28	15.81	47	1.78	6	\$97,468,657	5/86	* Multiple Advisors
Gr.Lawrence	106	5.52	106	7.68	106	7.28	48	1.71	105	\$1,630,771	7/86	Arlington Trust Company
Danvers	81	9.99	84	19.14	92	9.83	49	1.70	49	\$15,616,544	4/85	* Richard H. Morse
Brockton	51	11.83	46	22.37	67	12.46	50	1.63	15	\$49,301,033	3/85	Fort Hill
Medford	45	12.00	64	20.34	37	15.13	51	1.41	33	\$24,702,887	3/85	Constitution Capital Mgmt.
Waltham	27	13.06	49	22.19	17	16.65	52	1.40	27	\$33,670,129	2/85	BayBank Inc.
Worcester Co.	12	14.35	11	27.07	26	16.04	53	1.39	10	\$72,015,448		
Fitchburg	87	9.52	99	15.34	70	12.41	54	1.32	57	\$13,237,067	4/85	First Safety Fund Natl Bank
Watertown	70	10.87	72	19.89	74	12.22	55	1.30	52	\$15,379,794	3/85	Boston Company
Maynard	39	12.40	10	27.79	90	9.92	56	1.10	99	\$3,424,669		* Alex Brown
West Springfield	92	9.17	98	15.78	81	11.20	57	1.06	76	\$8,329,606	2/86	Shawmut First Bank & Trust
Everett	48	11.97	45	22.43	50	13.55	58	0.98	48	\$16,366,820	2/85	BayBank Inc.
Hingham	36	12.50	47	22.29	34	15.32	59	0.96	77	\$8,298,685	12/86	* Constitution Capital Mgmt.
Teachers	25	13.25	25	24.00	27	16.03	60	0.96	1	\$2,768,016,239	12/83	* Multiple Advisors
Brookline	89	9.47	97	16.24	76	11.79	61	0.95	22	\$36,513,338	6/86	State Street Research
Andover	17	13.80	13	26.80	36	15.15	62	0.95	71	\$10,358,674		
Westfield	50	11.90	65	20.28	32	15.60	63	0.77	47	\$16,693,877	4/85	Bank of New England-West
North Attleboro	79	10.05	90	17.64	66	12.65	64	0.57	83	\$7,029,793	2/87	Keystone Investment Mgmt.
Hull	88	9.51	92	17.27	80	11.36	65	0.56	95	\$3,775,717	7/85	Fort Hill
Greenfield	80	10.00	93	17.24	58	13.19	66	0.29	88	\$5,779,766	7/86	* Bank of New England-West
Amesbury	90	9.42	86	18.61	89	10.20	67	0.23	87	\$5,792,382	4/85	Richard H. Morse
Winchester	40	12.27	37	22.77	35	15.26	68	0.01	63	\$11,581,443	5/86	Tucker Anthony/RL Day Inc.
Natick	32	12.92	15	25.80	42	14.56	69	-0.08	53	\$14,467,600	3/85	United Investment Council
Chicopee	85	9.88	66	20.23	87	10.53	70	-0.17	31	\$25,032,077	6/86	* Multiple Advisors
Winthrop	74	10.68	87	18.51	40	14.68	71	-0.23	86	\$5,855,730	3/85	Constitution Capital Mgmt.
Franklin Co.	102	8.35	89	18.33	105	7.73	72	-0.23	79	\$8,108,915	12/85	* Tucker Anthony Management

\* Appendix I contains footnoted listings for Investment Managers, page 35.



MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS  
INVESTMENT REPORT

SYSTEM PERFORMANCE  
Asset Value; Investment Management

PAGE THREE

TABLE # 1

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System	1985-1987 Annualized		1985		1986		1987		12/31/87		Date of Waiver/ PRIT	Investment Manager(s)
	Time-Weighted Rank	Return	Time-Weighted Rank	Return	Time-Weighted Rank	Return	Time-Weighted Rank	Return	Market Value Rank	Value		
Peabody	37	12.42	34	23.23	29	15.77	73	-0.41	36	\$22,224,178	7/85	Tucker Anthony Management
Gloucester	22	13.41	16	25.70	19	16.57	74	-0.45	64	\$11,558,030	4/85	Tucker Anthony Management
Woburn	2	17.05	1	32.45	2	21.68	75	-0.51	51	\$15,464,408	3/88	David L. Babson
Marlborough	82	9.97	53	21.90	91	9.90	76	-0.72	72	\$10,137,339	6/88	Tucker Anthony Management
Beverly	75	10.63	62	20.71	61	12.98	77	-0.72	58	\$13,105,071		* Alex Brown
Mass Housing	105	5.91	105	9.57	98	9.39	78	-0.89	84	\$6,709,085	6/87	PRIM Board
Lexington	33	12.87	18	25.47	31	15.67	79	-0.92	50	\$15,538,671		
Essex County	26	13.16	19	25.18	12	17.15	80	-1.18	26	\$34,558,395	5/85	Tucker Anthony Management
Springfield	62	11.00	63	20.45	38	14.91	81	-1.19	9	\$74,654,770	5/85	* BayBank Inc.
Bristol Co.	78	10.05	59	21.06	79	11.43	82	-1.19	21	\$42,374,444	3/85	* Multiple Advisors
Plymouth County	34	12.82	21	24.65	15	16.71	83	-1.29	12	\$70,582,449	5/85	* John McLellan
Newburyport	98	8.85	69	20.08	100	9.18	84	-1.63	90	\$5,492,277	3/85	Richard H. Morse
Pittsfield	59	11.26	23	24.07	60	13.05	85	-1.80	35	\$23,512,902	12/86	* de Burlo Group
Chelsea	58	11.38	24	24.05	52	13.47	86	-1.83	62	\$12,292,385		*
Lynn	72	10.80	32	23.67	75	12.20	87	-1.97	16	\$45,644,954	3/85	de Burlo Group
Plymouth	23	13.31	5	28.31	30	15.73	88	-2.03	56	\$13,796,671		
Lawrence	73	10.74	31	23.68	72	12.24	89	-2.18	32	\$24,741,755	1/86	Natl Investment Services
North Adams	83	9.91	28	23.79	93	9.83	90	-2.34	85	\$6,130,341	3/85	de Burlo Group
Reading	66	10.95	12	26.86	84	10.73	91	-2.77	70	\$10,396,918	6/85	* PRIM Board
Southbridge	52	11.79	27	23.89	25	16.06	92	-2.84	98	\$3,482,527		
Cambridge	11	14.37	2	31.97	16	16.70	93	-2.86	7	\$86,853,900	5/88	* APT Financial Services
Belmont	86	9.65	26	23.90	97	9.59	94	-2.90	55	\$13,934,753	3/85	de Burlo Group
Malden	93	9.08	48	22.27	99	9.38	95	-2.95	44	\$19,152,131	3/85	de Burlo Group
Marblehead	103	8.35	54	21.89	104	7.87	96	-3.24	69	\$10,457,178	4/85	de Burlo Group
Boston	46	11.97	17	25.65	24	16.12	97	-3.78	4	\$656,993,342	2/85	* Multiple Advisors
Newton	76	10.43	44	22.47	44	14.33	98	-3.83	11	\$71,591,651	3/85	* Multiple Advisors
Swampscott	69	10.88	7	27.95	83	10.86	99	-3.90	91	\$5,239,925	3/85	de Burlo Group
Dukes County	95	9.03	41	22.70	85	10.68	100	-4.55	96	\$3,513,192		
Quincy	100	8.62	85	18.62	55	13.31	101	-4.67	14	\$53,941,635	5/85	South Shore Bank
Milford	104	7.45	76	19.66	103	8.97	102	-4.87	81	\$7,709,000		
Clinton	61	11.13	4	28.89	68	12.46	103	-5.30	94	\$3,804,545		*
Barnstable Co.	97	8.87	57	21.15	64	12.68	104	-5.49	17	\$44,445,552		
New Bedford	96	8.96	56	21.47	48	13.68	105	-6.32	20	\$42,577,265		*
Northampton	101	8.55	51	22.07	69	12.45	106	-6.83	80	\$7,714,523	4/85	de Burlo Group
Somerville	65	10.96	3	29.93	59	13.13	107	-7.07	23	\$35,679,139		*

\* Appendix I contains footnoted listings for Investment Managers, page 35.

TABLE #1 SYSTEM PERFORMANCE

Table #1 Indicates:

The 1985-1987 annualized time-weighted rate of return of each system and the system's ranking;

The 1985 time-weighted rate of return of each system and the system's ranking;

The 1986 time-weighted rate of return of each system and the system's ranking;

The 1987 time-weighted rate of return of each system and the system's ranking;

The December 31, 1987 asset value of the system at fair market value and the system's ranking;

The date, if any, that the system was exempted from the statutory investment restrictions as authorized by Chapter 66I and/or the date the system joined the PRIT Fund; and

The Investment Advisor for each system as listed on the Annual Statement filed by the system.

Measuring performance by time-weighting is the standard method by which the investment community compares performance. Time-weighting insulates performance calculations from changes in portfolio value that occur because of the timing and amount of cash flow. Time-weighting thus allows the comparison of the performance of portfolios which differ in the timing of cash flows over which the manager who makes investment decisions has no control. This method allows a fair measurement of the effectiveness of the investment decisions of the fund manager. The total return measurements included in this report include the income earned on the assets as well as the change in market value of the assets.

Since January 1, 1985 PERA's investment regulations have required each retirement system to send to PERA copies of cash book and journal entries for each month, monthly trial balances, and broker confirmations for all security transactions.

PERA's Pension Investment Advisory Unit assembles this information, interprets it where necessary to achieve uniformity, and enters it into a monitoring system provided on contract to PERA. PERA utilized the Annual Statements filed by the retirement systems for the year ending December 31, 1984 to establish the initial portfolio position of each system.

That initial position, and transaction journals indicating investment activity for each quarter as entered by PERA, were sent to each retirement system so that the system could audit PERA's information and insure its accuracy. As an additional check, at the end of each year, the closing position for each system was reconciled to the system's bank statement or Annual Statement of Financial Condition. PERA's records were closed on May 27, 1988 and incorporate all information received as of 5:00 P.M. on that date.

PERA would like to thank the members and employees of the Massachusetts Contributory Retirement Boards, and the investment advisors and custodian banks who serve the boards, for their cooperation in compiling this information.

The performance evaluation in this monitoring system is done using Bank Administration Institute Standards, which are those accepted in the investment community.

Contributions and withdrawals are entered at mid-month. Purchases and sales are entered on their trade dates. Fixed income interest is entered on an accrual basis. Short-term interest is entered on a cash basis. Dividends are entered on their ex-date. Market values for the portfolios are appraised quarterly and performance is linked on a quarterly basis. Performance for the three-year, 1985-1987, period has been annualized.

Table #1 lists the 1985-1987 annualized performance and the 1986 and 1987 performance of the 106 retirement systems as well as the Pension Reserve Investment Trust (PRIT) Fund. The 106th Massachusetts Contributory Retirement System, created in 1985 for employees of the Massachusetts Water and Sewer Authority, was not in existence on January 1, 1985. Therefore, performance for this system for 1985 is not included in this report. Annualized performance data for this system is since the system's inception on July 1, 1985.

Market values reflect the December 31, 1987 fair market value of each portfolio. (It should be noted that the valuation of the PRIT Fund includes the twelve local retirement systems which were participating in the pooled fund as of December 31, 1987.)

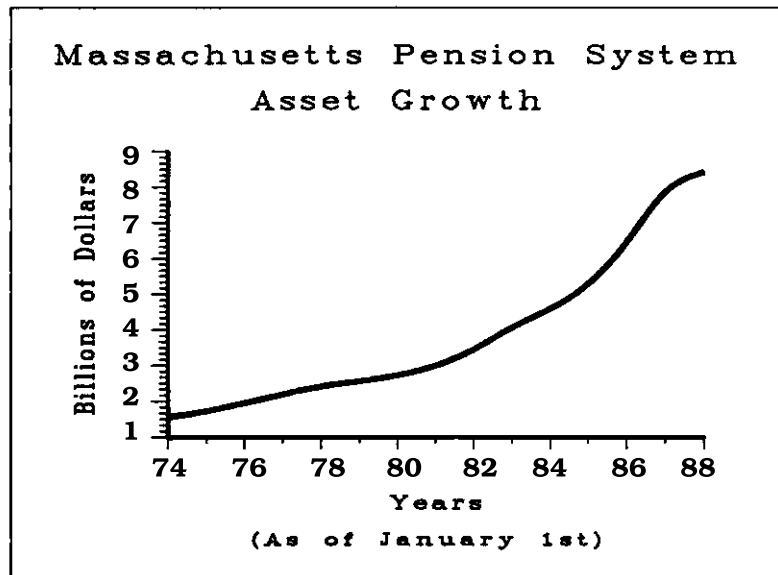
At the end of this report are:

Appendix 1 explaining footnoted (\*) listings for Investment Advisors, and listing the multiple advisors for systems having same; and

Appendix 2 listing Investment Advisors managing three or more retirement systems.

#### Asset Growth

The combination of the State government's Pension Reserve appropriations, the improved investment returns achieved under the prudent person standard, and the retention of all investment income in local systems' Pension Reserves under the provisions of Chapter 66I, has resulted in an acceleration of the growth of the Commonwealth's pension assets. In the four years since enactment of Chapter 66I, the assets of the Commonwealth's pension funds have doubled reaching \$8.4 billion on January 1, 1988.



The composite index consisting of 70% of the Shearson Lehman Government/Corporate Bond Index and 30% of the S&P Stock Index, which is the basis of the rate of return objective for each system established in PERA's investment regulations, returned 24.51% in 1985, 16.55% for 1986 and 3.17% for 1987. For the 1985-1987 period, the composite index returned 15.02%. (The PERA regulations were amended in August of 1987 to use the Shearson Lehman Government/Corporate Bond Index cited here rather than the Salomon Brothers High-Grade Long-Term Bond Index which had been used previously.)

This report on the 1987 performance of the State Employees' and Teachers' Retirement Systems includes Pension Reserve Funds of these two systems managed by the PRIM Board which were not included in PERA's report on 1985 performance. The performance of the PRIT Fund correctly includes the performance of the fund's real estate investments. PRIT will, in 1988, make adjustments to reflect the performance of its real estate investments which will affect the participating and purchasing systems. The effect of these adjustments will be to increase the performance of the participating and purchasing systems. This explains why, in the case of Gardner, PRIT's performance is higher than Gardner's performance.

This Division was unable to gain sufficient information from the Franklin County Retirement Board with regard to \$1,352.99. An unreconciled adjustment was made in this amount. An unreconciled adjustment was made for the Lexington Retirement Board for 1986 in the amount of \$49,427.47. An unreconciled adjustment was made for the Boston Retirement Board equal to .04% of the fund.

The performance for the Plymouth Retirement Board and the Marblehead Retirement Board for 1985 has been revised to 28.31% and 21.89%, respectively. The performance for the Everett Retirement Board for 1986 has been revised to 13.55%.

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS  
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SYSTEM PERFORMANCE  
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PAGE ONE

TABLE # 2  
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System	1987		1987 Quarterly Investment Returns							
	Time-Weighted		First		Second		Third		Fourth	
	Rank	Return	Rank	Return	Rank	Return	Rank	Return	Rank	Return
Adams	3	5.37	88	3.64	46	-0.41	37	1.21	13	0.85
Amesbury	67	0.23	54	5.69	45	-0.41	25	1.99	71	-6.63
Andover	62	0.95	102	2.55	88	-2.02	103	-4.09	2	4.75
Arlington	28	3.12	58	5.48	20	0.67	51	0.67	45	-3.54
Athol	20	3.72	84	4.05	22	0.57	61	0.27	22	-1.15
Attleboro	34	2.47	46	6.09	57	-0.61	29	1.64	52	-4.38
Barnstable Co.	104	-5.49	67	5.04	94	-2.43	86	-0.57	76	-7.25
Belmont	94	-2.90	17	9.19	33	0.00	3	3.89	106	-14.40
Berkshire Co.	46	1.84	93	3.30	70	-1.12	67	0.08	18	-0.39
Beverly	77	-0.72	55	5.66	90	-2.31	87	-0.58	43	-3.25
Blue Hills	29	3.09	64	5.33	51	-0.46	84	-0.43	24	-1.25
Boston	97	-3.78	26	7.91	75	-1.19	32	1.35	99	-10.96
Braintree	4	5.17	41	6.37	36	-0.08	65	0.22	25	-1.26
Bristol Co.	82	-1.19	20	8.96	44	-0.38	52	0.67	96	-9.58
Brockton	50	1.63	35	6.92	52	-0.49	22	2.27	70	-6.60
Brookline	61	0.95	91	3.52	69	-1.10	75	-0.21	23	-1.19
Cambridge	93	-2.86	31	7.35	104	-3.89	92	-1.23	55	-4.68
Chelsea	86	-1.83	57	5.52	59	-0.81	68	0.05	67	-6.24
Chicopee	70	-0.17	59	5.46	95	-2.50	98	-1.98	20	-0.96
Clinton	103	-5.30	47	6.06	101	-3.38	81	-0.36	77	-7.26
Concord	21	3.68	32	7.00	32	0.00	53	0.66	48	-3.74
Danvers	49	1.70	51	5.96	31	0.00	28	1.88	61	-5.79
Dedham	22	3.60	107	0.02	30	0.02	69	0.01	7	3.56
Dukes County	100	-4.55	49	6.03	98	-2.65	48	0.75	81	-8.22
Easthampton	42	1.99	48	6.03	78	-1.32	91	-1.09	26	-1.45
Essex County	80	-1.18	37	6.60	99	-2.80	100	-3.21	27	-1.47
Everett	58	0.98	42	6.32	66	-0.95	27	1.92	63	-5.92
Fairhaven	14	4.19	16	9.23	11	1.69	7	2.81	86	-8.76
Fall River	43	1.95	39	6.44	67	-0.95	30	1.58	57	-4.81
Falmouth	38	2.30	86	3.86	24	0.27	40	1.12	40	-2.86
Fitchburg	54	1.32	87	3.74	40	-0.25	80	-0.36	28	-1.73
Framingham	33	2.62	97	3.19	43	-0.37	79	-0.35	16	0.18
Franklin Co.	72	-0.23	29	7.68	25	0.19	24	2.10	95	-9.43
Gardner	26	3.16	19	9.06	13	1.35	6	2.85	92	-9.26
Gloucester	74	-0.45	23	8.54	96	-2.61	101	-3.33	36	-2.58
Gr. Lawrence	48	1.71	95	3.21	65	-0.93	20	2.40	39	-2.86
Greenfield	66	0.29	96	3.21	19	0.67	41	1.11	53	-4.53

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS  
INVESTMENT REPORT

SYSTEM PERFORMANCE  
Annual & By Quarter

TABLE # 2 PAGE TWO

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System	1987 Quarterly Investment Returns									
	1987		First		Second		Third		Fourth	
	Rank	Return	Rank	Return	Rank	Return	Rank	Return	Rank	Return
Hampden County	41	2.03	103	2.54	80	-1.39	78	-0.34	11	1.25
Hampshire Co.	12	4.41	105	1.47	54	-0.53	76	-0.28	6	3.73
Haverhill	31	2.87	90	3.53	85	-1.70	59	0.33	14	0.75
Hingham	59	0.96	100	2.72	72	-1.15	70	-0.02	19	-0.56
Holyoke	13	4.22	2	12.10	49	-0.44	54	0.60	75	-7.17
Hull	65	0.56	44	6.27	48	-0.44	5	2.86	79	-7.59
Lawrence	89	-2.18	3	10.70	106	-4.52	94	-1.40	66	-6.13
Leominster	35	2.46	50	5.99	50	-0.45	77	-0.30	37	-2.59
Lexington	79	-0.92	74	4.61	91	-2.34	104	-4.21	10	1.26
Lowell	19	3.74	83	4.07	62	-0.86	83	-0.42	12	0.97
Lynn	87	-1.97	18	9.16	35	-0.08	33	1.25	101	-11.22
Malden	95	-2.95	15	9.33	26	0.18	4	3.21	104	-14.14
Marblehead	96	-3.24	13	9.36	18	0.68	19	2.42	105	-14.20
Marlborough	76	-0.72	75	4.61	84	-1.67	35	1.24	54	-4.66
Mass Housing	78	-0.89	92	3.36	1	2.82	10	2.78	93	-9.27
Mass Port	17	3.93	28	7.71	16	0.90	71	-0.05	51	-4.32
Mass Turnpike	27	3.15	99	2.81	93	-2.39	97	-1.76	3	4.63
Mass Water	1	6.33	106	1.28	14	1.20	46	0.78	9	2.93
Maynard	56	1.10	40	6.44	89	-2.11	38	1.16	50	-4.08
Medford	51	1.41	60	5.42	53	-0.51	73	-0.16	42	-3.16
Melrose	39	2.11	66	5.06	27	0.17	57	0.39	44	-3.35
Methuen	45	1.86	89	3.56	29	0.09	62	0.24	31	-1.96
Middlesex Co.	40	2.06	62	5.38	47	-0.41	44	0.88	47	-3.60
Milford	102	-4.87	81	4.14	76	-1.29	82	-0.39	74	-7.09
Milton	9	4.46	4	10.12	10	1.71	11	2.76	91	-9.24
Minuteman	8	4.49	6	10.05	4	1.79	12	2.75	90	-9.22
Montague	5	4.86	12	9.52	3	1.84	15	2.63	83	-8.39
Natick	69	-0.08	69	4.95	39	-0.24	90	-1.02	46	-3.59
Needham	6	4.67	5	10.10	6	1.76	8	2.80	89	-9.12
New Bedford	105	-6.32	80	4.20	97	-2.62	93	-1.28	69	-6.47
Newburyport	84	-1.63	63	5.33	60	-0.82	21	2.30	80	-7.94
Newton	98	-3.83	82	4.11	71	-1.13	64	0.24	73	-6.79
Norfolk County	15	4.14	8	10.03	5	1.78	16	2.58	94	-9.35
North Adams	90	-2.34	34	6.98	64	-0.91	2	3.91	102	-11.34
North Attleboro	64	0.57	65	5.14	15	0.92	49	0.72	62	-5.90
Northampton	106	-6.83	24	8.49	77	-1.29	23	2.22	107	-14.88
Northbridge	18	3.78	73	4.67	23	0.35	74	-0.17	21	-1.03
Norwood	32	2.82	53	5.79	17	0.83	34	1.25	56	-4.79

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS  
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SYSTEM PERFORMANCE  
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TABLE # 2 PAGE THREE

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System	1987		1987 Quarterly Investment Returns							
	Time-Weighted		First		Second		Third		Fourth	
	Rank	Return	Rank	Return	Rank	Return	Rank	Return	Rank	Return
Peabody	73	-0.41	25	8.13	63	-0.90	106	-4.31	41	-2.88
Pittsfield	85	-1.80	61	5.41	58	-0.66	39	1.13	78	-7.28
Plymouth	88	-2.03	101	2.72	103	-3.86	102	-3.72	8	3.03
Plymouth County	83	-1.29	94	3.29	102	-3.63	107	-5.00	4	4.37
Prim Board	24	3.24	10	9.85	2	1.88	18	2.43	97	-9.93
Quincy	101	-4.67	98	2.86	79	-1.36	66	0.09	65	-6.12
Reading	91	-2.77	36	6.71	81	-1.42	45	0.86	82	-8.36
Revere	36	2.39	79	4.29	41	-0.31	42	1.08	35	-2.56
Salem	30	2.98	104	2.14	74	-1.16	96	-1.76	5	3.84
Saugus	16	3.98	21	8.92	12	1.69	9	2.80	85	-8.68
Shrewsbury	10	4.43	14	9.34	8	1.74	14	2.69	84	-8.59
Somerville	107	-7.07	11	9.81	105	-4.50	85	-0.45	100	-10.99
Southbridge	92	-2.84	71	4.78	100	-2.87	99	-2.06	34	-2.53
Springfield	81	-1.19	76	4.53	61	-0.85	47	0.77	60	-5.38
State Employees	44	1.88	30	7.66	28	0.12	36	1.24	72	-6.63
Stoneham	37	2.37	43	6.27	38	-0.20	58	0.33	49	-3.79
Swampscott	99	-3.90	22	8.79	68	-0.96	88	-0.67	98	-10.21
Taunton	2	6.06	27	7.82	34	-0.05	63	0.24	30	-1.82
Teachers	60	0.96	33	6.98	37	-0.16	43	0.94	68	-6.36
Wakefield	11	4.43	7	10.04	7	1.74	17	2.57	87	-9.06
Waltham	52	1.40	38	6.54	73	-1.15	31	1.51	58	-5.15
Watertown	55	1.30	77	4.36	83	-1.67	55	0.52	29	-1.80
Webster	23	3.36	52	5.82	86	-1.92	26	1.92	33	-2.29
Wellesley	25	3.24	1	14.56	55	-0.57	1	3.97	103	-12.83
West Springfield	57	1.06	78	4.31	82	-1.51	95	-1.61	17	-0.01
Westfield	63	0.77	45	6.18	56	-0.57	50	0.71	59	-5.22
Weymouth	7	4.53	9	10.00	9	1.74	13	2.72	88	-9.07
Winchester	68	0.01	72	4.73	92	-2.37	72	-0.12	32	-2.07
Winthrop	71	-0.23	68	5.01	21	0.62	56	0.47	64	-6.03
Woburn	75	-0.51	56	5.55	107	-6.16	105	-4.30	1	4.97
Worcester	47	1.78	70	4.83	42	-0.36	60	0.29	38	-2.84
Worcester Co.	53	1.39	85	3.99	87	-2.01	89	-0.83	15	0.34

TABLE #2 SYSTEM PERFORMANCE BY QUARTER

Table #2 indicates:

The time-weighted rate of return and ranking of each system with the systems listed in alphabetical order; and

Quarterly investment returns and rankings for each system.

For retirement systems owning group annuity contracts and/or retirement plan funding agreements issued by insurance companies, these assets were carried at the December 31, 1987 market value. Where market values were supplied, the performance for these contracts/agreements is noted in the fourth quarter as part of the fixed income performance. Depending on the magnitude of the contracts/agreements, retirement system performance will be understated in the first, second and third quarters and overstated in the fourth quarter as a result of this procedure.

The Dedham Retirement System, with 98.30% of its assets in contracts/agreements, had performance of 0.02% in the first quarter; 0.02% in the second quarter; 0.01% in the third quarter and 3.56% in the fourth quarter. The Dedham System's annual performance, however, is not affected materially by the timing of the market value reappraisal of the contracts/agreements. No other system approaches Dedham's commitment to group annuity contracts/retirement plan funding agreements.

Systems participating in the PRIT Fund receive an additional dividend for their investment by way of their proportionate share of a state appropriation pursuant to Chapter 32, s.22B of the General Laws. The result of this dividend in 1987 increased the quarterly performance and the total annual performance of the Fairhaven, Milton, Minuteman, Montague, Needham, Norfolk County, Saugus, Shrewsbury, Wakefield, Weymouth, State Employees' and Teachers' retirement systems. The Gardner Retirement System, which joined the PRIT Fund in December of 1986, and the MHFA, which joined the PRIT Fund in June of 1987, received appropriations for the first and second quarter fiscal appropriations only. The annualized performance of the Weymouth Retirement System reflects the dividend received by Weymouth in 1985. This state appropriation was accounted for as a contribution for the PRIT Fund itself and has no effect on the performance of this fund.

The composite Index consisting of 70% of the Shearson Lehman Government/Corporate Bond Index and 30% of the S&P Stock Index, which is the basis of the rate of return objective for each system established in PERA's investment regulations, returned 3.17% for 1987. The quarterly returns for 1987 for this Index were 7.44%, .18%, -.06%, and -2.68%.

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS  
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SYSTEM PERFORMANCE Annual;  
By Asset Class; Asset Allocation

TABLE # 3 PAGE ONE

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System	1987		Equity					Fixed Income				Cash			
	Time-Weighted	Return	Rank	Return	Beta	Rank	Allo-	Rank	Return	Rank	Allo-	Rank	Return	Rank	Allo-
	Rank						cation				cation				cation
Adams	3	5.37	105	-28.62	0.72	103	3.62	1	7.77	87	41.00	91	5.75	3	55.38
Amesbury	67	0.23	61	-5.01	0.88	47	30.43	25	3.16	49	57.65	81	6.17	49	11.92
Andover	62	0.95	103	-19.75	0.93	101	4.50	54	2.09	5	84.45	73	6.30	52	11.06
Arlington	28	3.12	50	-1.04	1.09	72	20.33	57	1.83	13	72.75	29	7.75	74	6.92
Athol	20	3.72	35	1.06	1.05	89	13.65	60	1.76	74	48.57	71	6.32	8	37.77
Attleboro	34	2.47	4	7.03	1.00	52	27.82	66	1.33	34	63.67	77	6.27	65	8.51
Barnstable Co.	104	-5.49	90	-11.82	0.94	92	12.64	95	-11.84	96	38.49	100	5.41	4	48.87
Belmont	94	-2.90	81	-10.07	1.00	16	47.83	8	4.69	80	47.53	43	7.17	94	4.64
Berkshire Co.	46	1.84	89	-10.83	0.81	96	11.66	22	3.61	71	49.35	93	5.69	7	38.99
Beverly	77	-0.72	71	-8.51	0.53	80	18.47	84	-0.80	8	78.47	48	7.04	102	3.06
Blue Hills	29	3.09	30	2.09	1.00	78	18.76	26	3.10	31	65.92	62	6.52	37	15.32
Boston	97	-3.78	58	-4.29	0.96	17	47.42	74	0.40	102	33.46	27	7.87	28	19.13
Braintree	4	5.17	26	2.74	1.04	87	13.85	69	0.83	55	56.17	80	6.23	10	29.98
Bristol Co.	82	-1.19	70	-8.24	0.89	26	40.77	24	3.28	77	48.03	64	6.46	51	11.20
Brockton	50	1.63	48	-0.61	1.10	61	23.77	19	3.74	64	52.57	99	5.44	18	23.65
Brookline	61	0.95	3	7.17	1.06	79	18.75	78	0.15	24	68.97	19	8.30	48	12.28
Cambridge	93	-2.86	98	-14.57	0.76	59	24.93	76	0.38	27	67.71	79	6.26	72	7.36
Chelsea	86	-1.83	84	-10.10	1.03	38	33.35	72	0.51	43	60.62	60	6.73	84	6.03
Chicopee	70	-0.17	53	-1.55	0.98	55	26.39	82	-0.31	73	49.00	59	6.85	16	24.60
Clinton	103	-5.30	100	-17.85	0.84	58	25.12	86	-1.76	51	57.02	74	6.29	31	17.86
Concord	21	3.68	7	6.18	0.79	51	28.27	38	2.57	60	54.31	96	5.59	32	17.41
Danvers	49	1.70	54	-2.62	0.83	50	30.10	15	4.04	37	62.16	83	6.10	70	7.74
Dedham	22	3.60	106	N/A	0.00	105	0.00	21	3.63	1	98.47	107	1.39	106	1.52
Dukes County	100	-4.55	101	-18.55	0.83	74	19.89	92	-3.95	26	67.82	2	12.26	47	12.29
Easthampton	42	1.99	45	-0.32	1.03	67	21.54	67	1.23	22	69.58	10	9.59	62	8.87
Essex County	80	-1.18	39	0.07	1.01	45	31.17	87	-1.87	62	53.32	41	7.19	36	15.51
Everett	58	0.98	10	5.36	0.98	33	34.54	65	1.38	39	61.80	17	8.36	99	3.66
Fairhaven	14	4.19	20	4.05	0.00	18	47.34	45	2.41	103	33.32	92	5.75	27	19.34
Fall River	43	1.95	9	5.44	0.99	54	26.89	64	1.43	46	58.30	32	7.67	40	14.82
Falmouth	38	2.30	5	6.95	0.92	46	30.65	13	4.25	42	60.66	16	8.64	63	8.9
Fitchburg	54	1.32	62	-5.54	0.54	69	21.18	34	2.69	17	71.67	8	9.89	73	7.15
Framingham	33	2.62	51	-1.18	0.57	73	20.28	11	4.54	16	71.82	26	7.88	68	7.90
Franklin Co.	72	-0.23	65	-7.07	0.93	29	38.07	6	4.83	61	53.81	51	7.02	66	8.12
Gardner	26	3.16	24	3.36	0.00	3	55.72	97	N/A	91	39.22	9	9.85	88	5.06
Gloucester	74	-0.45	36	0.82	1.02	31	37.32	89	-2.28	57	55.92	14	8.81	75	6.76
Gr.Lawrence	48	1.71	40	0.06	0.30	28	38.90	88	-1.89	88	40.42	76	6.28	24	20.68
Greenfield	66	0.29	44	-0.16	0.93	41	32.86	16	3.97	82	45.56	69	6.34	21	21.58



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<div> <div>TABLE # 3</div> <div>SYSTEM PERFORMANCE Annual; By Asset Class; Asset Allocation</div> <div>PAGE TWO</div> </div>															
System	1987		Equity					Fixed Income				Cash			
	Time-Weighted Rank	Return	Rank	Return	Beta	Rank	Allo-cation	Rank	Return	Rank	Allo-cation	Rank	Return	Rank	Allo-cation
Hampden County	41	2.03	25	2.90	1.22	70	21.07	42	2.49	21	69.63	54	6.98	59	9.30
Hampshire Co.	12	4.41	41	0.00	0.92	104	0.82	28	2.97	45	59.35	33	7.65	6	39.84
Haverhill	31	2.87	1	9.30	1.19	43	31.72	23	3.50	33	65.56	37	7.47	104	2.72
Hingham	59	0.96	94	-12.96	0.83	95	11.79	31	2.85	18	71.65	13	8.92	33	16.56
Holyoke	13	4.22	29	2.11	1.08	25	41.59	50	2.26	65	52.37	78	6.27	83	6.04
Hull	65	0.56	68	-8.09	1.06	65	22.28	58	1.80	75	48.50	1	13.20	12	29.22
Lawrence	89	-2.18	99	-15.81	1.39	64	23.09	75	0.39	23	69.47	61	6.53	71	7.44
Leominster	35	2.46	46	-0.40	0.67	66	21.90	43	2.44	54	56.55	25	7.92	22	21.55
Lexington	79	-0.92	93	-12.57	1.03	93	12.26	71	0.69	7	78.60	38	7.44	60	9.14
Lowell	19	3.74	60	-5.00	0.65	98	10.78	18	3.88	32	65.81	56	6.96	19	23.41
Lynn	87	-1.97	82	-10.09	0.93	21	43.88	10	4.59	63	52.93	20	8.22	101	3.19
Malden	95	-2.95	79	-9.65	1.03	15	48.45	3	7.41	79	47.54	102	5.26	97	4.01
Marblehead	96	-3.24	74	-9.11	0.93	9	52.91	12	4.53	83	45.04	5	10.09	105	2.04
Marlborough	76	-0.72	96	-13.60	0.90	91	12.87	85	-0.96	15	72.30	90	5.87	39	14.83
Mass Housing	78	-0.89	22	3.74	0.00	5	55.25	52	2.25	93	38.88	103	5.23	85	5.87
Mass Port	17	3.93	6	6.34	1.07	32	36.68	44	2.42	53	56.66	36	7.54	76	6.66
Mass Turnpike	27	3.15	57	-3.60	0.50	97	11.20	30	2.87	11	74.47	58	6.87	42	14.34
Mass Water	1	6.33	107	N/A	0.00	106	0.00	98	N/A	107	0.00	70	6.33	1	100.00
Maynard	56	1.10	86	-10.27	0.86	71	20.37	73	0.45	85	43.24	94	5.64	9	36.39
Medford	51	1.41	66	-7.34	0.99	77	18.81	32	2.84	29	66.81	85	6.03	41	14.38
Melrose	39	2.11	55	-2.76	1.09	82	18.28	55	2.04	44	59.88	22	8.09	20	21.84
Methuen	45	1.86	69	-8.21	1.02	86	14.70	14	4.09	6	78.70	98	5.48	78	6.60
Middlesex Co.	40	2.06	43	-0.12	1.03	53	27.24	27	3.03	40	61.76	24	7.94	53	11.00
Milford	102	-4.87	80	-10.05	0.64	83	17.57	93	-4.66	30	66.42	87	5.92	34	16.01
Milton	9	4.46	17	4.42	0.00	7	54.80	99	N/A	95	38.57	104	4.95	77	6.63
Minuteman	8	4.49	12	4.64	0.00	2	56.09	100	N/A	90	39.47	66	6.41	95	4.44
Montague	5	4.86	11	4.66	0.00	14	50.49	101	N/A	101	35.53	67	6.41	44	13.98
Natick	69	-0.08	76	-9.42	0.81	76	19.22	59	1.77	19	71.05	46	7.07	57	9.73
Needham	6	4.67	14	4.57	0.00	6	54.95	102	N/A	94	38.68	28	7.85	79	6.37
New Bedford	105	-6.32	104	-22.82	0.82	94	11.98	94	-7.93	28	67.11	65	6.46	23	20.91
Newburyport	84	-1.63	78	-9.63	0.92	36	34.01	9	4.61	70	50.00	86	5.97	35	15.98
Newton	98	-3.83	59	-4.30	1.12	27	39.27	83	-0.39	78	47.77	40	7.22	46	12.97
Norfolk County	15	4.14	18	4.32	0.00	4	55.38	103	N/A	92	38.97	47	7.05	86	5.67
North Adams	90	-2.34	83	-10.09	1.03	24	43.07	39	2.56	86	42.83	30	7.72	43	14.10
North Attleboro	64	0.57	67	-8.04	1.07	40	32.98	53	2.22	36	62.27	63	6.48	92	4.75
Northampton	106	-6.83	92	-12.37	0.97	10	52.89	63	1.50	84	43.49	3	11.09	100	3.61
Northbridge	18	3.78	28	2.63	0.91	85	15.49	37	2.65	58	54.91	35	7.61	11	29.59
Norwood	32	2.82	33	1.42	0.86	39	33.06	7	4.74	52	56.86	68	6.36	56	10.08

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TABLE # 3			SYSTEM PERFORMANCE Annual; By Asset Class; Asset Allocation										PAGE THREE			
*****																
System	1987		Equity					Fixed Income				Cash				
	Time-Weighted Rank	Return	Rank	Return	Beta	Rank	Allo- cation	Rank	Return	Rank	Allo- cation	Rank	Return	Rank	Allo- cation	
Peabody	73	-0.41	38	0.57	1.04	30	37.39	90	-3.28	48	57.92	31	7.68	93	4.69	
Pittsfield	85	-1.80	75	-9.22	0.88	49	30.16	17	3.93	81	45.74	89	5.91	17	24.09	
Plymouth	88	-2.03	88	-10.62	0.70	88	13.69	80	-0.01	9	78.24	105	3.04	67	8.07	
Plymouth County	83	-1.29	97	-13.73	0.85	99	10.28	81	-0.16	4	84.94	23	8.01	90	4.78	
Prim Board	24	3.24	27	2.74	0.73	1	56.14	46	2.39	89	39.51	15	8.76	96	4.35	
Quincy	101	-4.67	56	-2.97	1.11	35	34.19	91	-3.44	41	61.04	4	10.26	91	4.77	
Reading	91	-2.77	91	-11.87	0.96	37	33.97	35	2.69	47	58.14	52	7.02	69	7.89	
Revere	36	2.39	64	-6.46	1.08	90	13.10	79	0.13	106	29.84	57	6.88	2	57.06	
Salem	30	2.98	2	7.52	0.91	102	3.77	61	1.73	10	75.97	50	7.03	26	20.27	
Saugus	16	3.98	21	3.75	0.00	23	43.14	104	N/A	105	30.36	53	7.00	14	26.50	
Shrewsbury	10	4.43	16	4.46	0.00	8	53.03	105	N/A	98	37.33	42	7.18	58	9.64	
Somerville	107	-7.07	23	3.74	0.00	107	0.00	96	-12.26	2	91.39	34	7.63	64	8.61	
Southbridge	92	-2.84	102	-19.18	0.79	75	19.27	41	2.51	66	52.04	95	5.60	13	28.70	
Springfield	81	-1.19	85	-10.15	1.09	56	26.29	20	3.64	59	54.66	75	6.29	29	19.04	
State Employees	44	1.88	42	-0.03	0.39	20	45.24	47	2.35	76	48.40	49	7.04	80	6.36	
Stoneham	37	2.37	37	0.69	1.06	60	24.05	33	2.76	50	57.62	88	5.92	30	18.34	
Swampscott	99	-3.90	77	-9.56	0.95	19	45.40	29	2.97	72	49.23	7	10.07	87	5.37	
Taunton	2	6.06	13	4.60	1.00	48	30.42	36	2.66	25	68.97	18	8.31	107	0.61	
Teachers	60	0.96	47	-0.53	0.38	22	43.61	48	2.35	69	50.13	97	5.54	81	6.26	
Wakefield	11	4.43	19	4.24	0.00	11	52.72	106	N/A	99	37.11	72	6.31	55	10.17	
Waltham	52	1.40	8	5.67	0.98	44	31.48	68	1.12	35	63.62	45	7.12	89	4.90	
Watertown	55	1.30	31	1.91	1.18	57	26.13	51	2.26	20	70.18	39	7.30	98	3.69	
Webster	23	3.36	87	-10.40	0.90	68	21.38	2	7.56	97	37.92	55	6.98	5	40.71	
Wellesley	25	3.24	32	1.49	1.02	12	52.41	70	0.80	104	32.35	11	9.09	38	15.25	
West Springfld	57	1.06	49	-0.69	0.82	81	18.41	56	1.90	14	72.46	12	8.94	61	9.13	
Westfield	63	0.77	34	1.20	1.09	34	34.46	62	1.53	67	51.65	84	6.05	45	13.89	
Weymouth	7	4.53	15	4.47	0.00	13	52.35	107	N/A	100	36.84	101	5.39	54	10.81	
Winchester	68	0.01	72	-8.78	1.11	84	17.48	49	2.33	38	62.14	82	6.14	25	20.37	
Winthrop	71	-0.23	63	-6.33	1.08	63	23.21	40	2.53	68	51.13	44	7.13	15	25.66	
Woburn	75	-0.51	95	-13.34	0.96	100	6.92	77	0.21	3	86.93	106	2.74	82	6.15	
Worcester	47	1.78	52	-1.41	0.68	42	32.26	5	4.91	56	56.09	21	8.14	50	11.65	
Worcester Co.	53	1.39	73	-9.07	0.61	62	23.75	4	4.99	12	73.29	6	10.08	103	2.96	

TABLE #3    SYSTEM PERFORMANCE BY ASSET CLASS

Table #3 Indicates:

The 1987 time-weighted rate of return and ranking of each system listed in alphabetical order;

The annual return and ranking on the equity portion of the retirement system's portfolio which includes common and preferred stock;

The December 31, 1987 Beta for the equity portion of the retirement system's portfolio;  
(Beta is an investment concept which evolved from linear regression analysis, where it measures the slope of expected values, or rather, the percentage volatility of a particular stock. This measure examines the riskiness of an individual stock by comparing its price volatility with that of the overall market. In this analysis, a Beta factor of 1.0 is assigned to the S&P 500 Index, and the price volatility of individual stocks relative to the overall market price fluctuations of the Index determines the Beta of the individual security. Thus, if the price movements on a day-to-day basis for a given stock are 50% wider than the S&P 500 Stock Index price movements, the individual stock's Beta would be 1.5. On the other hand, a lower volatility stock might have a market Beta of 0.75, meaning its day-to-day price movement is only three-quarters that of the overall market Index. Investment theories suggest that risk is compensated by higher returns, and that over time, high Beta stocks should be rewarded by higher returns. With the potential for higher returns, however, comes the higher risk, particularly in down markets. PERA's Investment regulation requires that systems exempt from the "legal list" not exceed an annual average Beta of 1.15 for the equity portion of the board's portfolio.)

The December 31, 1987 percentage of the retirement system's portfolio invested in equities and the ranking of this allocation;

The annual return and ranking on the fixed income portion of the portfolio which includes all fixed income securities and group annuity contracts/retirement plan funding agreements;

The December 31, 1987 percentage of the portfolio committed to fixed income securities and group annuity contracts/retirement plan funding agreements and the ranking of this allocation;

The annual return and ranking on cash which includes cash and cash equivalent investments; and

The December 31, 1987 percentage of the retirement system's portfolio committed to cash and the ranking of this allocation.

The asset allocation for retirement systems continuing to operate within the statutory "legal list" allows such systems to invest:

In Fixed Income obligations of the U. S. Government and its agencies;

Up to 20% in fixed income obligations of railroad corporations;

Up to 35% in fixed income obligations of telephone companies;

Up to 50% in the fixed income obligations of public service companies;

Up to 15% in fixed income obligations of other corporations;

Up to 25% in equities of bank and insurance companies;

In money market funds;

In certificates of deposit; and

In group annuity contracts and/or retirement plan funding agreements issued by insurance companies.

Retirement systems which have been authorized by PERA to invest without being subjected to the "legal list" restrictions, must meet asset allocation guidelines set by PERA as follows:

Up to 40% in equity investments:

75% of equity investments must be in companies with \$100 Million in outstanding equity. Not more than 5% of equity investments may be in any one company;

Equities must be traded on U. S. Stock Exchange or over the counter;

Turnover of the equity portfolio is limited to 50% per year;

Real estate investments are included within the 40% of the portfolio committed to equity and may not exceed 5% of the portfolio; and

Venture Capital falls within the 40% allocation to equity and is limited to 3% or 5% of the portfolio depending on the size of the retirement system.

Between 40 and 80% of the portfolio is to be allocated to fixed income investments:

Fixed income securities must have a minimum quality rating of BAA;

75% of fixed income securities must be rated A or better;

No more than 5% of the portfolio may be invested in the fixed income obligations of any one company;

Fixed income investments shall only be made in issues with an outstanding par value of \$50 Million at the time of purchase; and

Turnover of fixed income investments is limited to 100%.

Up to 40% of the portfolio in Cash and Cash Equivalent Investments:

Money market funds;

Commercial paper;

Certificates of deposit; and

Repurchase agreements.

PERA regulations authorize retirement systems to invest pursuant to supplementary regulations which authorize investments other than those outlined here.

Systems joining the PRIT Fund hold shares of the PRIT Fund (which are treated as equities in PERA's monitoring system) and cash and cash equivalent investments authorized under the statutory "legal list".

The Fairhaven, Gardner, Milton, Minuteman, Montague, Needham, Norfolk County, Saugus, Shrewsbury, Wakefield, and Weymouth Retirement Systems hold shares of the PRIT Fund, however, the asset allocation indicated in Table #3 reflects the asset allocation of the PRIT Fund itself. The equity performance as indicated in the table includes the fixed income performance of these portfolios as well. The fixed income performance of the Fairhaven Retirement System reflects two bonds which matured in 1987. The equity beta of zero reflects the volatility of the units against the market index.

The MHFA Retirement System holds shares of the PRIT Fund, however, the asset allocation indicated in Table #3 reflects the asset allocation of the PRIT Fund itself. The equity performance as indicated in the table includes the fixed income performance for this system once it transferred into the PRIT Fund. The fixed income performance represents the performance of the fixed income portfolio prior to transfer into the PRIT Fund. The equity beta of zero reflects the volatility of the units against the market index.

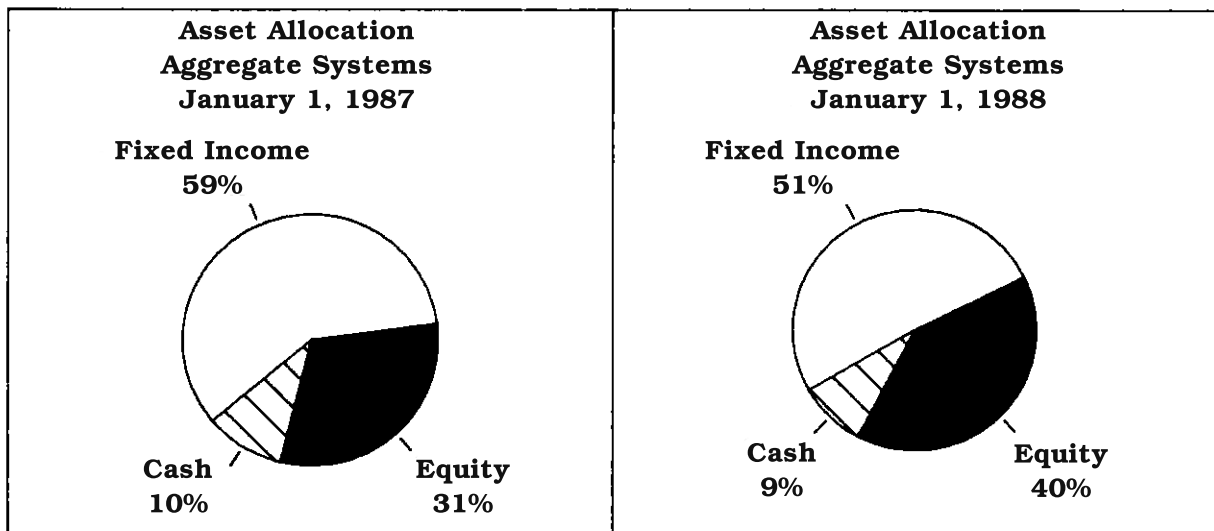
For the PRIM Board, no beta was calculated for international equity holdings. A zero beta was included in the calculation of the portfolio beta for these securities, thereby, understating the portfolio beta.

The State Employees' and Teachers' Retirement Systems hold shares of the Treasurer's Fixed Income Securities Trust, the Treasurer's Management Trust (an equity trust) and the PRIT Fund, however, the asset allocation as indicated in Table #3 represents the actual asset allocation of these funds. The equity performance as indicated in the table reflects the performance of the Treasurer's Management Trust, as reported by Massachusetts Fiduciary Advisors, Inc., as well as the PRIT Fund. The fixed income performance reflects the performance of the Treasurer's Fixed Income Securities Trust as reported by Massachusetts Fiduciary Advisors, Inc.

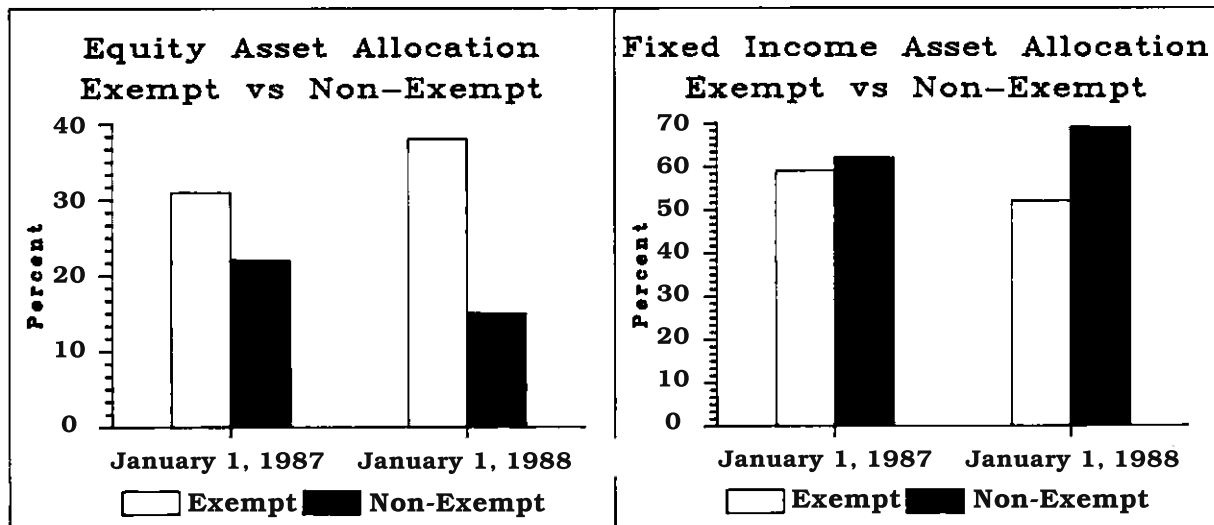
The cash performance as indicated in the table represents the performance of the cash portfolio as income is received, rather than earned, which may in some cases understate the cash performance in one year and overstate the cash performance in another year.

#### Asset Allocation

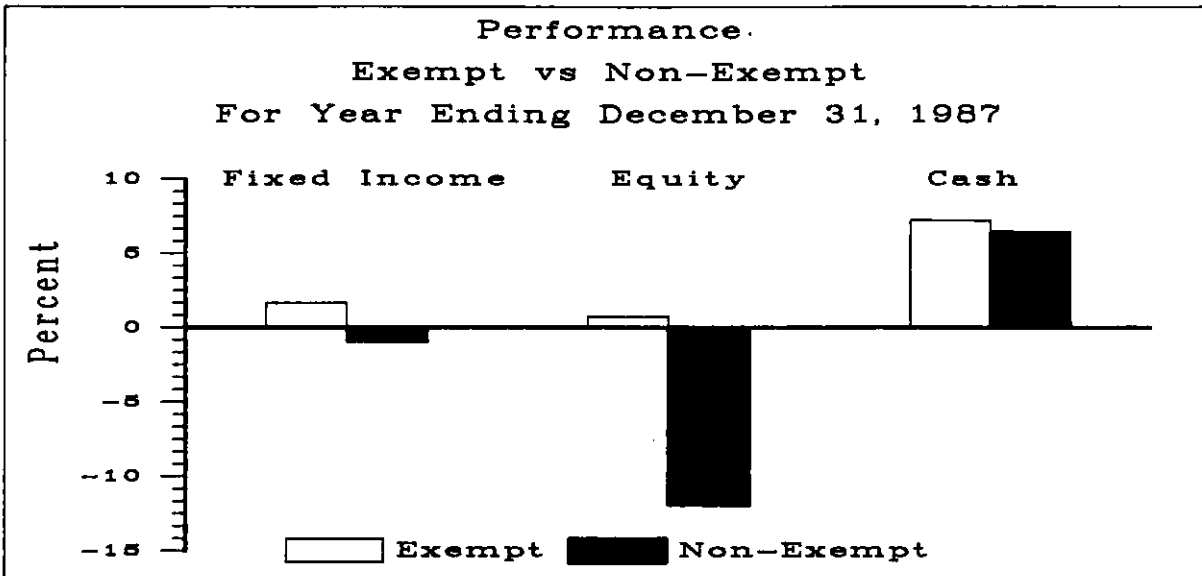
If we look at the asset allocation of the retirement systems as a whole, we can see that during 1987, the retirement systems allocated an additional 10% of assets to equities which historically have outperformed the other asset classes.



If we look at the equity allocation of the exempt systems, we see that in 1987 that allocation was increased, while in that same period, the equity allocation for the non-exempt systems decreased. The exempt systems moved money out of bonds while the non-exempt systems increased their allocation to this asset class.

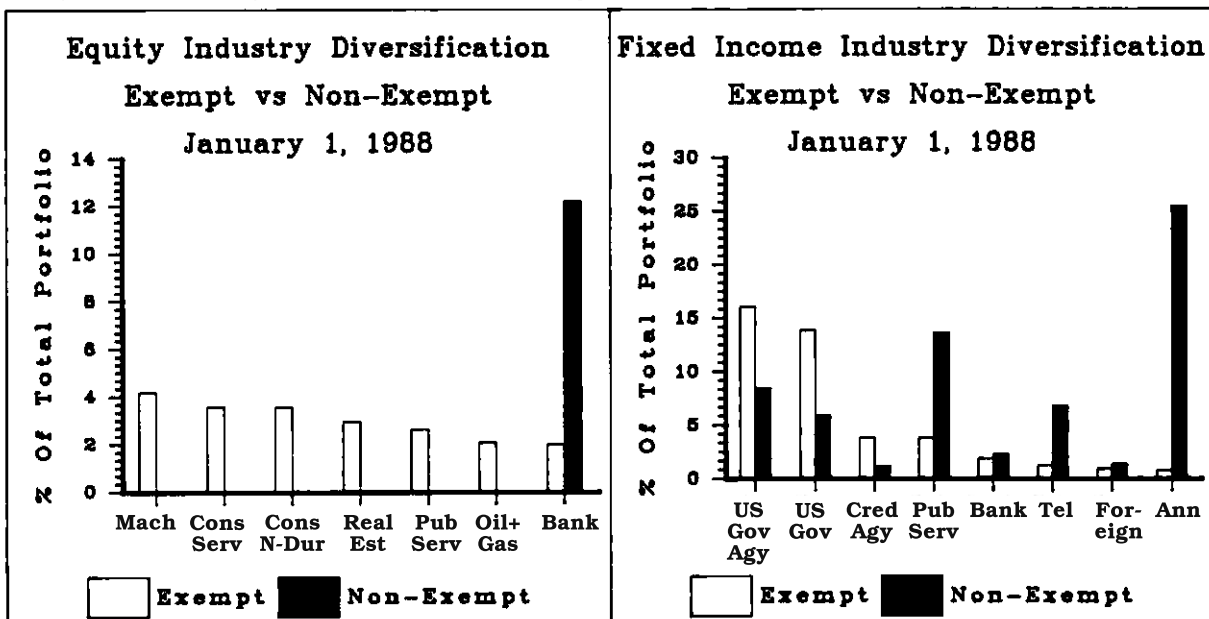


The exempt systems outperformed the non-exempt systems in each of the asset classes. The exempt systems outperformed the non-exempt systems by 1,261 basis points in the equity asset class, by 256 basis points in the fixed income asset class and by 79 basis points in cash. The diversification offered under the waiver proved to be the most important factor affecting the performance of the retirement systems in 1987.

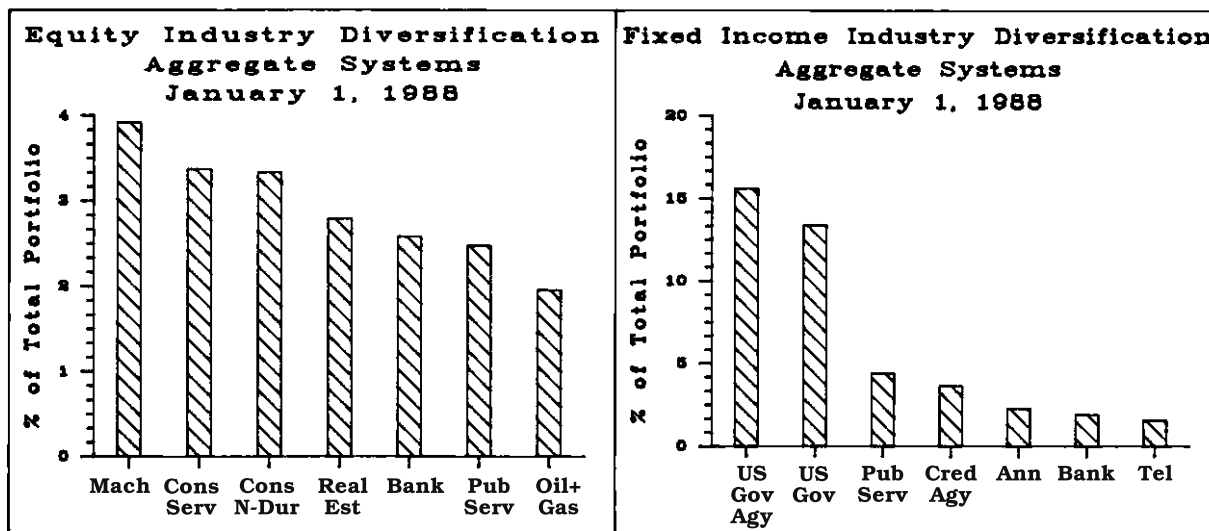


One of the other significant shifts in asset allocation which has continued in 1987 has been the diversification of the systems' portfolios in a broad range of industries within each asset class. Particularly in equities, the non-exempt systems concentrated investment in a narrow range of industries. As of January 1, 1988, these charts indicate that non-exempt systems had their entire equity exposure concentrated in bank stocks which jeopardized the performance of the retirement systems' portfolios. Over time, the broad diversification achieved by the exempt systems will improve both the return and security of the investment portfolios.

In the Fixed Income area there has been less of a difference in industry concentration. Perhaps the retirement statute in Massachusetts (which carries Fixed Income investments at amortized book values and further requires losses incurred when such securities are sold at market values below that amortized book to be made up through the appropriation process) partially explain the slower pace by which industry diversification is being achieved in the fixed income portfolios.



In the aggregate, we can see that broad diversification has been achieved in the equity allocation, while in the fixed income area, there remains a concentration in U.S. Government Agencies and U.S. Government obligations.



For 1987, the Standard & Poor's 500 Stock Index returned 5.2%, the Keefe, Bruyette & Woods, Inc. Index (which includes the stocks of money center institutions and large regional banks) returned -13.88%, and the Europe, Asia and Far East Index (which includes foreign stocks) returned 24.6%. The Shearson Lehman Government/Corporate Bond Index returned 2.3% while the Salomon Brothers High-Grade Long-Term Bond Index returned -.27%. The U.S. Treasury Bill returned 6.41%.

#### Largest Holdings

##### Equities

##### Aggregate

<u>Security</u>	<u># Shares Owned</u>	<u>Market Value</u>	<u>% of Market Value</u>
IBM	102,610	11,851,455.00	.14
Digital Equipment	74,731	10,088,685.00	.12
UST Corp	393,900	7,681,050.00	.09
Boston Five Cent Svgs	461,866	6,754,790.25	.08
Atlantic Richfield	96,500	6,658,500.00	.08

This list excludes shares owned in the Treasurer's Fixed Income Securities Trust Fund (25.46%), the PRIT Fund (24.00%), and the Treasurer's Management Trust Fund (17.87%).

##### Fixed Income

##### Aggregate

<u>Security</u>	<u>Par Value Owned</u>	<u>Market Value</u>	<u>% of Market Value</u>
U.S. Treas. 11.75% 11/15/93	16,785,000	19,166,371.88	.23
U.S. Treas. 7.375% 5/15/96	17,750,000	16,146,953.13	.19
U.S. Treas. 11.625% 1/15/92	11,800,000	13,105,375.00	.16
U.S. Treas. 11.25% 2/15/95	10,850,000	12,236,765.63	.15
U.S. Treas. 9.125% 2/15/91	11,900,000	12,212,375.00	.15

This list excludes holdings of group annuity contracts and retirement plan funding agreements.

The 12/31/87 market value of the aggregate systems was \$8,418,342,578; the market value of exempted systems was \$7,900,306,960; the market value of legal list systems was \$518,035,618.

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS  
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SYSTEM PERFORMANCE Annualized;  
By Asset Class

TABLE # 3A

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System	1985-1987 Annualized Time-Weighted		1985-1987 Annualized Equity		1985-1987 Annualized Fixed Income		1985-1987 Annualized Cash	
	Rank	Return	Rank	Return	Rank	Return	Rank	Return
Weymouth	1	17.16	34	19.14	107	N/A	99	6.28
Woburn	2	17.05	29	19.59	2	16.81	97	6.35
Taunton	3	16.26	6	24.24	12	14.61	48	7.76
Holyoke	4	15.01	3	33.01	42	13.58	70	7.28
Prim Board	5	14.98	40	18.24	4	15.83	12	9.11
Wakefield	6	14.84	44	18.04	106	N/A	36	8.04
Norfolk County	7	14.83	9	23.33	103	N/A	45	7.85
Needham	8	14.76	37	18.94	102	N/A	39	7.95
Mass Port	9	14.65	49	17.40	16	14.53	28	8.26
Braintree	10	14.58	46	17.81	24	14.10	69	7.28
Cambridge	11	14.37	52	16.82	41	13.58	74	7.10
Worcester Co.	12	14.35	19	21.22	28	14.04	13	9.03
Wellesley	13	14.32	78	12.85	5	15.48	15	8.95
Dedham	14	14.30	106	N/A	19	14.36	105	4.53
Mass Turnpike	15	13.94	98	4.18	1	17.12	65	7.33
Haverhill	16	13.81	13	22.31	3	16.32	78	6.98
Andover	17	13.80	94	6.75	7	15.01	73	7.11
Stoneham	18	13.80	15	22.19	18	14.47	62	7.38
Fall River	19	13.74	60	15.96	13	14.60	9	9.24
State Employees	20	13.66	76	12.98	29	14.03	79	6.98
Shrewsbury	21	13.48	51	17.27	105	N/A	77	7.02
Gloucester	22	13.41	14	22.28	45	13.46	17	8.84
Plymouth	23	13.31	55	16.60	27	14.05	107	1.26
Adams	24	13.25	99	3.27	8	14.97	101	6.24
Teachers	25	13.25	81	12.70	30	14.03	89	6.65
Essex County	26	13.16	16	22.10	23	14.19	29	8.16
Waltham	27	13.06	32	19.27	54	12.99	6	9.48
Arlington	28	13.06	64	15.35	56	12.83	42	7.89
Minuteman	29	13.01	85	11.93	100	N/A	61	7.38
Middlesex Co.	30	12.96	58	16.43	33	13.96	4	9.91
Melrose	31	12.95	45	17.82	31	14.01	32	8.08
Natick	32	12.92	31	19.29	62	12.47	72	7.18
Lexington	33	12.87	12	22.54	53	13.01	51	7.71
Plymouth County	34	12.82	62	15.67	43	13.58	16	8.85
Lowell	35	12.61	5	31.57	39	13.63	71	7.21
Hingham	36	12.50	36	18.94	44	13.55	47	7.76
Peabody	37	12.42	7	23.95	64	12.36	63	7.35
Milton	38	12.40	2	33.17	99	N/A	100	6.25
Maynard	39	12.40	57	16.53	84	10.44	80	6.97
Winchester	40	12.27	10	23.23	10	14.76	76	7.07
Salem	41	12.12	43	18.10	9	14.86	64	7.34
Easthampton	42	12.05	48	17.54	17	14.50	8	9.28
Berkshire Co.	43	12.03	39	18.36	21	14.28	49	7.74
Worcester	44	12.02	24	20.71	48	13.16	34	8.06
Medford	45	12.00	54	16.73	59	12.64	50	7.72
Boston	46	11.97	30	19.35	14	14.58	27	8.32
Webster	47	11.97	41	18.22	80	10.98	53	7.64
Everett	48	11.97	33	19.14	68	11.99	33	8.06
Hampden County	49	11.96	4	32.33	76	11.25	46	7.78
Westfield	50	11.90	17	21.51	51	13.09	66	7.32
Brockton	51	11.83	69	13.95	25	14.09	98	6.32
Southbridge	52	11.79	27	20.27	40	13.62	102	6.19
Gardner	53	11.65	77	12.97	97	N/A	21	8.58



MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS  
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SYSTEM PERFORMANCE Annualized;  
By Asset Class

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TABLE # 3A								
System	1985-1987 Annualized Time-Weighted		1985-1987 Annualized Equity		1985-1987 Annualized Fixed Income		1985-1987 Annualized Cash	
	Rank	Return	Rank	Return	Rank	Return	Rank	Return
Framingham	54	11.63	18	21.41	66	12.01	23	8.43
Fairhaven	55	11.57	26	20.28	91	8.71	103	6.15
Methuen	56	11.54	47	17.73	63	12.37	96	6.35
Attleboro	57	11.52	21	20.99	77	11.13	86	6.74
Chelsea	58	11.38	73	13.19	46	13.31	104	5.02
Pittsfield	59	11.26	42	18.13	22	14.25	40	7.92
Leominster	60	11.21	22	20.78	15	14.54	43	7.88
Clinton	61	11.13	65	14.72	70	11.94	83	6.90
Springfield	62	11.00	25	20.67	55	12.92	90	6.63
Hampshire Co.	63	10.98	63	15.36	69	11.98	35	8.04
Northbridge	64	10.97	71	13.38	32	14.01	22	8.50
Somerville	65	10.96	11	22.68	93	7.65	37	7.99
Reading	66	10.95	86	11.30	20	14.34	10	9.19
Athol	67	10.95	8	23.53	83	10.54	31	8.09
Norwood	68	10.93	61	15.70	57	12.68	67	7.31
Swampscott	69	10.88	66	14.66	61	12.53	2	10.51
Watertown	70	10.87	38	18.38	86	10.05	84	6.90
Falmouth	71	10.82	103	1.04	50	13.09	52	7.65
Lynn	72	10.80	87	10.89	26	14.05	44	7.88
Lawrence	73	10.74	101	1.68	37	13.71	91	6.60
Winthrop	74	10.68	93	7.93	49	13.12	95	6.38
Beverly	75	10.63	53	16.78	47	13.19	38	7.96
Newton	76	10.43	68	14.14	52	13.03	59	7.41
Concord	77	10.24	102	1.52	58	12.66	92	6.57
Bristol Co.	78	10.05	72	13.37	74	11.52	26	8.39
North Attleboro	79	10.05	79	12.77	78	11.07	56	7.49
Greenfield	80	10.00	95	6.01	73	11.53	85	6.76
Danvers	81	9.99	59	16.13	75	11.28	58	7.43
Marlborough	82	9.97	56	16.53	90	9.04	88	6.68
North Adams	83	9.91	74	13.07	35	13.86	7	9.33
Saugus	84	9.91	100	2.10	104	N/A	82	6.95
Chilcopee	85	9.88	20	21.17	82	10.71	19	8.78
Belmont	86	9.65	91	8.85	38	13.65	24	8.40
Fitchburg	87	9.52	67	14.56	6	15.07	14	9.00
Hull	88	9.51	75	13.00	34	13.89	18	8.80
Brookline	89	9.47	1	33.47	81	10.90	30	8.14
Amesbury	90	9.42	35	19.01	71	11.77	94	6.41
Blue Hills	91	9.27	83	12.37	94	7.62	87	6.70
West Springfield	92	9.17	105	-0.44	85	10.37	5	9.68
Malden	93	9.08	90	9.84	36	13.74	75	7.09
Montague	94	9.04	23	20.74	101	N/A	55	7.51
Dukes County	95	9.03	70	13.75	89	9.22	11	9.11
New Bedford	96	8.96	92	8.56	79	11.04	60	7.39
Barnstable Co.	97	8.87	89	10.40	95	7.51	25	8.39
Newburyport	98	8.85	50	17.38	60	12.63	68	7.29
Revere	99	8.71	80	12.70	11	14.70	54	7.57
Quincy	100	8.62	28	20.17	87	9.56	20	8.68
Northampton	101	8.55	88	10.70	72	11.59	1	11.84
Franklin Co.	102	8.35	97	4.26	67	12.01	93	6.52
Marblehead	103	8.35	82	12.58	65	12.05	3	10.13
Milford	104	7.45	84	12.17	92	8.24	57	7.48
Mass Housing	105	5.91	96	4.54	88	9.27	41	7.90
Gr.Lawrence	106	5.52	104	0.23	96	1.06	81	6.95
Mass Water	107	4.40	107	N/A	98	N/A	106	3.63

TABLE #3A SYSTEM ANNUALIZED PERFORMANCE BY ASSET CLASS

Table #3A indicates:

The 1985-1987 annualized time-weighted return and ranking of each system listed so that the system with the highest 1985-1987 time-weighted rate of return is listed first and the system with the lowest time-weighted rate of return is listed last;

The annualized return and ranking of the equity portion of the retirement system's portfolio which includes common and preferred stock;

The annualized return and ranking of the fixed income portion of the retirement system's portfolio which includes all fixed income securities and group annuity contracts/retirement plan funding agreements; and

The annualized return and ranking of cash which includes cash and cash equivalent investments.

The Gardner, Milton, Minuteman, Montague, Needham, Norfolk County, Saugus, Shrewsbury, Wakefield, and Weymouth Retirement Systems hold shares of the PRIT Fund which are considered equity investments. The annualized equity performance as indicated in Table #3A for these systems includes the fixed income performance of these portfolios as well. The Fairhaven Retirement System owns shares of the PRIT Fund. However, some fixed income investments were not transferred to PRIT because they were due to mature in 1987. MHFA Retirement System owns shares of the PRIT Fund. However, some fixed income investments were not transferred to PRIT until June 1987. The fixed income performance for these two systems reflects the performance of these investments. After the transfer to PRIT was completed, the equity performance for these systems includes the performance of the fixed income portfolio.

The State Employees' and Teachers' Retirement Systems hold shares of the Treasurer's Fixed Income Securities Trust, the Treasurer's Management Trust (an equity trust) and, in 1986 and 1987, the PRIT Fund. The equity performance as indicated in the table reflects the performance of the Treasurer's Management Trust and for 1986 and 1987 includes the performance of the PRIT Fund. The fixed income performance reflects the performance of the Treasurer's Fixed Income Securities Trust.

The performance for the Plymouth Retirement System was based on a revised 1985 cash performance of .56%. The performance of the Everett Retirement System was based on a revised 1986 cash performance of 7.94%. The performance of the Marblehead Retirement System was based on a revised fixed income performance of 18.05%, equity performance of 48.53% and cash performance of 12.40% for 1985 and a revised cash performance of 7.94% in 1986.

For the 1985-1987 period, the Standard & Poor's 500 Stock Index returned 18.13%, the Keefe, Bruyette & Woods, Inc. Index (which includes the stocks of money center institutions and large regional banks) returned 9.23%, and the Europe, Asia and Far East Index (which includes foreign stocks) returned 48.90%. The Shearson Lehman Government/Corporate Bond Index returned 12.79% while the Salomon Brothers High-Grade Long-Term Bond Index returned 15.86%. The U.S. Treasury Bill returned 7.15%.

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS  
INVESTMENT REPORT

SYSTEM PERFORMANCE Time Weighted;  
Transaction Activity

TABLE # 4 PAGE ONE

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System	1987 Time-Weighted Rank	1987 Return	Total Equity Sales	As a % of Equity Market Value	Rank	Total Fixed Income Sales	As a % of Fixed Income Market Value	Rank
Adams	3	5.37	1,867,210	N/A	105	731,230	50.80%	24
Amesbury	67	0.23	766,757	43.51%	63	215,102	6.44%	79
Andover	62	0.95	28,831	6.19%	90	897,844	10.26%	70
Arlington	28	3.12	6,143,319	100.12%	31	2,664,838	12.14%	64
Athol	20	3.72	207,527	54.34%	60	150,000	11.04%	67
Attleboro	34	2.47	3,512,977	117.82%	21	8,220,827	120.46%	13
Barnstable Co.	104	-5.49	8,923,107	158.86%	5	24,481,186	143.11%	9
Belmont	94	-2.90	9,089,201	136.44%	10	2,031,668	30.69%	33
Berkshire Co.	46	1.84	100,568	6.03%	91	760,301	10.77%	68
Beverly	77	-0.72	3,665,249	151.45%	6	50,000	0.49%	89
Blue Hills	29	3.09	7,150	1.96%	97	269,045	21.01%	44
Boston	97	-3.78	414,551,405	133.08%	11	556,893,221	253.36%	1
Braintree	4	5.17	3,573,443	132.19%	12	8,064,129	73.53%	20
Bristol Co.	82	-1.19	20,449,941	118.36%	19	5,782,582	28.41%	37
Brockton	50	1.63	9,506,062	81.11%	43	9,234,626	35.63%	29
Brookline	61	0.95	4,095,685	59.81%	57	28,765,514	114.23%	15
Cambridge	93	-2.86	8,671,437	40.03%	65	2,522,048	4.29%	86
Chelsea	86	-1.83	8,439,144	205.86%	2	3,761,235	50.48%	25
Chicopee	70	-0.17	5,424,973	82.11%	41	21,751,745	177.34%	5
Clinton	103	-5.30	898,825	94.05%	33	257,400	11.87%	65
Concord	21	3.68	770,341	31.54%	66	602,537	12.84%	60
Danvers	49	1.70	2,353,835	50.07%	62	1,341,539	13.82%	59
Dedham	22	3.60	0	0.00%	101	189,467	2.20%	88
Dukes County	100	-4.55	839,876	120.20%	17	126,251	5.30%	82
Easthampton	42	1.99	173,522	19.84%	72	104,582	3.70%	87
Essex County	80	-1.18	7,366,234	68.38%	49	40,490,610	219.74%	3
Everett	58	0.98	6,682,163	118.21%	20	14,257,414	140.95%	10
Fairhaven	14	4.19	488,000	14.76%	78	8,000	N/A	106
Fall River	43	1.95	13,048,492	111.57%	24	27,836,099	109.77%	16
Falmouth	38	2.30	177,916	7.99%	86	3,777,368	85.72%	19
Fitchburg	54	1.32	1,975,125	70.44%	48	2,410,744	25.41%	40
Framingham	33	2.62	100,919	1.92%	98	2,904,288	15.64%	55
Franklin Co.	72	-0.23	3,209,825	103.97%	29	1,125,974	25.80%	39
Gardner	26	3.16	1,338,482	23.86%	69	0	0.00%	91
Gloucester	74	-0.45	3,757,695	87.11%	38	10,402,503	160.96%	7
Gr. Lawrence	48	1.71	394,231	62.15%	55	0	0.00%	92
Greenfield	66	0.29	184,983	9.74%	81	768,591	29.19%	36
Hampden County	41	2.03	7,550,224	102.43%	30	20,913,704	85.86%	18
Hampshire Co.	12	4.41	0	0.00%	102	2,031,362	15.84%	54
Haverhill	31	2.87	4,793,158	62.93%	52	8,313,337	52.81%	23
Hingham	59	0.96	164,500	16.81%	75	752,467	12.65%	61
Holyoke	13	4.22	16,107,726	122.81%	16	3,768,941	22.82%	43
Hull	65	0.56	743,741	88.44%	35	331,919	18.12%	50
Lawrence	89	-2.18	10,127,556	177.31%	3	21,329,504	124.09%	12
Leominster	35	2.46	1,774,488	72.29%	47	559,516	8.83%	73
Lexington	79	-0.92	170,718	8.96%	82	845,662	6.92%	77
Lowell	19	3.74	2,112,084	55.95%	58	1,456,371	6.32%	80
Lynn	87	-1.97	22,597,254	112.82%	23	3,382,982	14.00%	58
Malden	95	-2.95	11,467,006	123.59%	15	3,403,570	37.38%	27
Marblehead	96	-3.24	7,654,340	138.33%	9	1,671,337	35.48%	30
Marlborough	76	-0.72	1,834,325	140.65%	7	618,488	8.44%	75
Mass Housing	78	-0.89	N/A	N/A	106	N/A	N/A	107
Mass Port	17	3.93	5,405,870	26.95%	67	6,334,950	20.45%	46

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS  
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SYSTEM PERFORMANCE Time Weighted;  
Transaction Activity

TABLE # 4

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System	1987 Time-Weighted Rank	1987 Return	Total Equity Sales	As a % of Equity Market Value	Rank	Total Fixed Income Sales	As a % of Fixed Income Market Value	Rank
Mass Turnpike	27	3.15	2,706,392	54.68%	59	6,864,782	20.86%	45
Mass Water	1	6.33	0	0.00%	103	0	0.00%	93
Maynard	56	1.10	755,688	108.32%	26	184,508	12.46%	63
Medford	51	1.41	3,802,424	81.84%	42	3,141,743	19.04%	49
Melrose	39	2.11	1,989,770	86.07%	39	535,569	7.07%	76
Methuen	45	1.86	92,472	5.81%	92	565,000	6.62%	78
Middlesex Co.	40	2.06	26,894,097	77.43%	45	75,648,603	96.05%	17
Milford	102	-4.87	1,904,081	140.55%	8	233,573	4.56%	84
Milton	9	4.46	1,097,866	8.83%	84	0	0.00%	94
Minuteman	8	4.49	0	0.00%	104	0	0.00%	95
Montague	5	4.86	312,495	15.19%	76	0	0.00%	96
Natick	69	-0.08	362,250	13.03%	79	0	0.00%	97
Needham	6	4.67	1,687,272	8.35%	85	0	0.00%	98
New Bedford	105	-6.32	8,602,615	168.68%	4	35,575,284	124.50%	11
Newburyport	84	-1.63	792,548	42.42%	64	471,680	17.17%	51
Newton	98	-3.83	30,304,537	107.79%	27	59,455,688	173.87%	6
Norfolk County	15	4.14	3,766,000	4.75%	94	0	0.00%	99
North Adams	90	-2.34	3,016,717	114.24%	22	329,752	12.56%	62
North Attleboro	64	0.57	5,113,647	220.53%	1	1,471,253	33.61%	31
Northampton	106	-6.83	4,321,489	105.90%	28	1,014,498	30.23%	35
Northbridge	18	3.78	207,181	52.53%	61	443,091	31.69%	32
Norwood	32	2.82	464,941	6.73%	89	1,200,000	10.09%	71
Peabody	73	-0.41	7,336,305	88.28%	36	26,953,545	209.41%	4
Pittsfield	85	-1.80	5,612,131	79.13%	44	2,993,170	27.83%	38
Plymouth	88	-2.03	2,403,636	127.21%	13	5,238,168	48.53%	26
Plymouth County	83	-1.29	4,535,922	62.53%	54	14,886,972	24.83%	41
Prim Board	24	3.24	607,850,299	62.12%	56	453,688,627	67.23%	22
Quincy	101	-4.67	18,090,244	98.09%	32	77,791,081	236.25%	2
Reading	91	-2.77	4,367,852	123.68%	14	1,832,452	30.31%	34
Revere	36	2.39	1,400,446	62.70%	53	588,626	11.56%	66
Salem	30	2.98	39,824	4.87%	93	836,000	5.06%	83
Saugus	16	3.98	1,093,330	17.34%	73	0	0.00%	100
Shrewsbury	10	4.43	689,495	7.90%	87	0	0.00%	101
Somerville	107	-7.07	20,906,780	N/A	107	2,041,119	6.26%	81
Southbridge	92	-2.84	445,267	66.35%	51	290,251	16.02%	53
Springfield	81	-1.19	3,392,305	17.28%	74	3,837,442	9.40%	72
State Employees	44	1.88	43,250,000	1.59%	99	0	0.00%	102
Stoneham	37	2.37	283,114	10.85%	80	2,255,674	36.10%	28
Swampscott	99	-3.90	2,078,169	87.36%	37	515,805	19.99%	47
Taunton	2	6.06	4,531,702	73.54%	46	2,777,588	19.88%	48
Teachers	60	0.96	189,736,957	6.87%	88	0	0.00%	103
Wakefield	11	4.43	1,738,721	14.85%	77	0	0.00%	104
Waltham	52	1.40	11,678,029	110.18%	25	25,597,098	119.50%	14
Watertown	55	1.30	4,795,114	119.32%	18	1,845,295	17.10%	52
Webster	23	3.36	584,625	92.92%	34	269,107	24.12%	42
Wellesley	25	3.24	9,078,681	85.29%	40	10,159,696	154.64%	8
West Springfield	57	1.06	356,825	23.27%	70	4,216,670	69.86%	21
Westfield	63	0.77	1,527,623	26.55%	68	1,298,000	15.05%	57
Weymouth	7	4.53	1,564,000	8.88%	83	0	0.00%	105
Winchester	68	0.01	70,688	3.49%	96	313,411	4.35%	85
Winthrop	71	-0.23	11,009	0.81%	100	457,836	15.29%	56
Woburn	75	-0.51	724,878	67.69%	50	3,838	0.03%	90
Worcester	47	1.78	1,423,627	4.53%	95	5,885,793	10.77%	69
Worcester Co.	53	1.39	3,540,563	20.71%	71	4,473,063	8.47%	74

TABLE #4 TIME-WEIGHTED RETURN; TRANSACTION ACTIVITY

Table #4 indicates:

The 1987 time-weighted rate of return and rank of each system listed in alphabetical order;

The dollar value of all equity sales made by the retirement system during 1987;

The percentage of December 31, 1987 equity market value represented by the total equity sales during the year and the percentage ranking;

The dollar value of all fixed income sales made by the retirement system during 1987 (the dollar value of fixed income sales includes principal paydowns on pass-through type securities); and

The percentage of December 31, 1987 fixed income market value represented by the total fixed income sales during the year and the percentage ranking.

The information in Table #4 gives an indication as to whether the retirement system maintained an active or passive investment style. It is the responsibility of each retirement board member as a fiduciary to insure that turnover levels are consistent with authorized turnover levels.

The system joining the PRIT Fund in 1987 (MHFA) liquidated its entire portfolio and purchased the full value in PRIT units, thus, turnover for this system has not been included in this table.

The turnover percentage for fixed income investments for the Fairhaven Retirement System has not been included due to the fact no fixed income investments were owned as of December 31, 1987. The equity turnover percentage for the Somerville Retirement System has not been included due to the fact that no individual equity investments were owned as of December 31, 1987. All equity investments for this system are reflected in the group annuity contracts/retirement plan funding agreements which are categorized as fixed income investments. No equity turnover has been included for the Adams Retirement System due to the fact that the small allocation to equities at the end of the year made any percentage calculation meaningless.

Turnover as reported for systems participating in the PRIT Fund, as well as for State Employees' and Teachers', reflects redemption of trust fund units.

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS  
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SYSTEM PERFORMANCE  
South Africa Analysis  
TABLE # 5  
\*\*\*\*\* PAGE ONE \*\*\*\*\*

System	1985-1987 Annualized Time-Weighted		1987 Time-Weighted		% of Market Value Invested In		
	Rank	Return	Rank	Return	Cash	Non South Africa	South Africa
Adams	24	13.25	3	05.37	55.38	39.44	05.18
Amesbury	90	09.42	67	00.23	08.47	75.16	16.37
Andover	17	13.80	62	00.95	11.06	78.05	10.89
Arlington	28	13.06	28	03.12	06.92	78.63	14.45
Athol	67	10.95	20	03.72	30.09	51.80	18.11
Attleboro	57	11.52	34	02.47	08.51	82.05	09.44
Barnstable Co.	97	08.87	104	-05.49	10.62	88.55	00.83
Belmont	86	09.65	94	-02.90	04.69	67.44	27.87
Berkshire Co.	43	12.03	46	01.84	08.82	85.12	06.06
Beverly	75	10.63	77	-00.72	01.54	90.74	07.72
Blue Hills	91	09.27	29	03.09	15.32	68.10	16.58
Boston	46	11.97	97	-03.78	10.27	80.97	08.76
Braintree	10	14.58	4	05.17	29.98	63.12	06.90
Bristol Co.	78	10.05	82	-01.19	11.15	71.26	17.59
Brockton	51	11.83	50	01.63	23.37	66.55	10.08
Brookline	89	09.47	61	00.95	12.28	87.67	00.05
Cambridge	11	14.37	93	-02.86	05.01	89.05	05.94
Chelsea	58	11.38	86	-01.83	01.76	92.07	06.17
Chilcopee	85	09.88	70	-00.17	12.68	71.17	16.15
Clinton	61	11.13	103	-05.30	04.72	91.12	04.16
Concord	77	10.24	21	03.68	17.41	81.01	01.58
Danvers	81	09.99	49	01.70	07.74	76.52	15.74
Dedham	14	14.30	22	03.60	01.26	98.74	00.00
Dukes County	95	09.03	100	-04.55	03.75	95.50	00.75
Easthampton	42	12.05	42	01.99	08.87	85.06	06.07
Essex County	26	13.16	80	-01.18	14.93	64.28	20.79
Everett	48	11.97	58	00.98	03.66	86.36	09.98
Fairhaven	55	11.57	14	04.19	15.68	N/A	N/A
Fall River	19	13.74	43	01.95	07.92	74.50	17.58
Falmouth	71	10.82	38	02.30	08.69	72.24	19.07
Fitchburg	87	09.52	54	01.32	05.26	86.52	08.22
Framingham	54	11.63	33	02.62	01.48	96.26	02.26
Franklin Co.	102	08.35	72	-00.23	05.65	65.80	28.55
Gardner	53	11.65	26	03.16	00.74	N/A	N/A
Gloucester	22	13.41	74	-00.45	04.91	77.71	17.38
Gr. Lawrence	106	05.52	48	01.71	20.68	71.78	07.54
Greenfield	80	10.00	66	00.29	21.58	69.28	09.14
Hampden County	49	11.96	41	02.03	05.78	77.51	16.71
Hampshire Co.	63	10.98	12	04.41	24.10	70.65	05.25
Haverhill	16	13.81	31	02.87	02.72	79.24	18.04
Hingham	36	12.50	59	00.96	14.63	80.02	05.35
Holyoke	4	15.01	13	04.22	05.73	74.10	20.17
Hull	88	09.51	65	00.56	23.53	65.75	10.72
Lawrence	73	10.74	89	-02.18	07.44	80.24	12.32
Leominster	60	11.21	35	02.46	02.84	89.00	08.16
Lexington	33	12.87	79	-00.92	08.67	86.82	04.51
Lowell	35	12.61	19	03.74	-00.12	88.91	11.21
Lynn	72	10.80	87	-01.97	02.75	71.05	26.20
Malden	93	09.08	95	-02.95	03.33	77.23	19.44
Marblehead	103	08.35	96	-03.24	02.04	72.08	25.88
Marlborough	82	09.97	76	-00.72	12.86	87.14	00.00
Mass Housing	105	05.91	78	-00.89	01.58	N/A	N/A
Mass Port	9	14.65	17	03.93	06.66	80.07	13.27

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS  
INVESTMENT REPORT

SYSTEM PERFORMANCE  
South Africa Analysis  
TABLE # 5  
\*\*\*\*\*

PAGE TWO

System	1985-1987 Annualized Time-Weighted		1987 Time-Weighted		% of Market Value Invested in		
	Rank	Return	Rank	Return	Cash	Non South Africa	South Africa
Mass Turnpike	15	13.94	27	03.15	12.98	73.94	13.08
Mass Water	107	04.40	1	06.33	100.00	00.00	00.00
Maynard	39	12.40	56	01.10	33.47	64.91	01.62
Medford	45	12.00	51	01.41	13.67	79.01	07.32
Melrose	31	12.95	39	02.11	21.05	68.79	10.16
Methuen	56	11.54	45	01.86	06.60	87.17	06.23
Middlesex Co.	30	12.96	40	02.06	07.55	83.38	09.07
Milford	104	07.45	102	-04.87	16.01	83.99	00.00
Milton	38	12.40	9	04.46	02.38	N/A	N/A
Minuteman	29	13.01	8	04.49	00.09	N/A	N/A
Montague	94	09.04	5	04.86	10.07	N/A	N/A
Natick	32	12.92	69	-00.08	09.73	84.60	05.67
Needham	8	14.76	6	04.67	02.11	N/A	N/A
New Bedford	96	08.96	105	-06.32	20.44	79.56	00.00
Newburyport	98	08.85	84	-01.63	15.07	66.27	18.66
Newton	76	10.43	98	-03.83	10.19	75.94	13.87
Norfolk County	7	14.83	15	04.14	01.23	N/A	N/A
North Adams	83	09.91	90	-02.34	04.31	74.29	21.40
North Attleboro	79	10.05	64	00.57	02.53	87.84	09.63
Northampton	101	08.55	106	-06.83	01.02	70.82	28.16
Northbridge	64	10.97	18	03.78	22.72	62.98	14.30
Norwood	68	10.93	32	02.82	05.02	91.76	03.22
Peabody	37	12.42	73	-00.41	04.69	72.93	22.38
Pittsfield	59	11.26	85	-01.80	20.69	61.12	18.19
Plymouth	23	13.31	88	-02.03	08.00	88.61	03.39
Plymouth County	34	12.82	83	-01.29	04.02	79.89	16.09
Prim Board	5	14.98	24	03.24	01.57	N/A	N/A
Quincy	100	08.62	101	-04.67	03.59	82.45	13.96
Reading	66	10.95	91	-02.77	07.89	65.35	26.76
Revere	99	08.71	36	02.39	22.36	72.02	05.62
Salem	41	12.12	30	02.98	20.27	73.43	06.30
Saugus	84	09.91	16	03.98	23.15	N/A	N/A
Shrewsbury	21	13.48	10	04.43	05.53	N/A	N/A
Somerville	65	10.96	107	-07.07	05.83	94.05	00.12
Southbridge	52	11.79	92	-02.84	05.01	93.33	01.66
Springfield	62	11.00	81	-01.19	11.66	80.27	08.07
State Employees	20	13.66	44	01.88	00.49	N/A	N/A
Stoneham	18	13.80	37	02.37	18.34	66.62	15.04
Swampscott	69	10.88	99	-03.90	01.55	69.01	29.44
Taunton	3	16.26	2	06.06	00.61	76.88	22.51
Teachers	25	13.25	60	00.96	00.28	N/A	N/A
Wakefield	6	14.84	11	04.43	06.09	N/A	N/A
Waltham	27	13.06	52	01.40	04.90	85.06	10.04
Watertown	70	10.87	55	01.30	03.69	89.25	07.06
Webster	47	11.97	23	03.36	20.32	77.39	02.29
Wellesley	13	14.32	25	03.24	01.79	75.82	22.39
West Springfield	92	09.17	57	01.06	06.73	72.77	20.50
Westfield	50	11.90	63	00.77	13.89	68.21	17.90
Weymouth	1	17.16	7	04.53	06.75	N/A	N/A
Winchester	40	12.27	68	00.01	19.51	62.84	17.65
Winthrop	74	10.68	71	-00.23	25.31	70.02	04.67
Woburn	2	17.05	75	-00.51	03.85	92.72	03.43
Worcester	44	12.02	47	01.78	06.42	84.22	09.36
Worcester Co.	12	14.35	53	01.39	00.18	98.38	01.44

TABLE #5 SOUTH AFRICA ANALYSIS

Table #5 Indicates:

The 1985-1987 time-weighted rate of return and ranking of each system listed in alphabetical order;

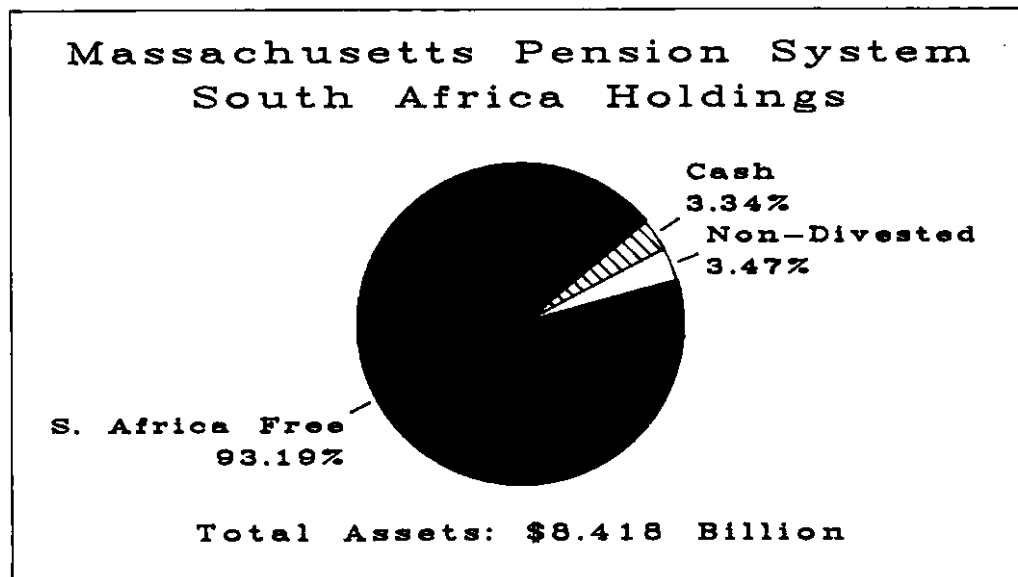
The 1987 time-weighted rate of return and ranking of each system;

The percent of the December 31, 1987 market value of each system invested in cash (cash is defined as checking, savings and money market fund accounts);

The percent of the December 31, 1987 market value of each system invested in the short-term, equity and fixed income securities of companies not doing business in South Africa; and

The percent of the December 31, 1987 market value of each system invested in the short-term, equity and fixed income securities of companies doing business in South Africa.

Since January, 1983, the Commonwealth has invested its assets in enterprises free of involvement in South Africa. The State Employees' and Teachers' Retirement Systems, the PRIT Fund and the 15 participating systems in the PRIT Fund are investing South Africa free. Legislation passed in January of 1988 requires that systems investing free of the statutory restrictions on investments limit new investments to companies free of involvement in South Africa. As of January 1, 1988, over 96 percent of the \$8.418 billion in public pension assets is South Africa free.



This Division uses a list of U.S. companies doing business in South Africa provided by Massachusetts Fiduciary Advisors, Inc. The same list is provided by the Pension Reserve Investment Trust Fund for non-U.S. companies. PERA is working towards establishment of a list of companies doing business in South Africa.

For systems owning group annuity contracts and/or retirement plan funding agreements and mutual funds, this analysis does not include the underlying securities of such contracts and funds.



MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS  
INVESTMENT REPORT

SYSTEM PERFORMANCE

TABLE # 6 By Investment Advisor (for Advisors managing three or more retirement systems)

\*\*\*\*\*

Investment Advisors	# of Systems	1985-1987 Annualized Time-Weighted			1987 Time-Weighted			1987 Market Value		
		Rank1	Rank2	Return	Rank1	Rank2	Return	Rank1	Rank2	Value
Prim Board	12	1	11	14.53	1	16	4.07	2	5	182,379,595
Shawmut Bank	4	8	49	11.96	2	33	2.63	8	24	35,402,961
Bank of New England - West	3	9	50	11.90	3	38	2.35	7	19	44,078,194
David L. Babson	3	5	35	12.61	4	39	2.19	10	35	23,627,636
Boston Company	3	7	40	12.28	5	39	2.14	6	10	74,372,749
Constitution Capital Management	6	4	35	12.71	6	39	2.13	4	6	102,590,862
BayBank	4	2	30	12.96	7	50	1.66	3	6	104,254,355
Richard H. Morse	3	11	87	9.64	8	64	0.70	9	30	26,901,204
Alex, Brown and Sons	3	3	35	12.73	9	68	0.12	11	44	19,472,838
Tucker Anthony Management Co.	4	6	37	12.46	10	76	-0.66	5	7	93,372,680
de Burlo Group	11	10	83	9.91	11	90	-2.28	1	5	192,666,984

\*\*\*\*NOTE: Rank1 denotes the ranking among the 11 managers.  
Rank2 denotes the ranking of the managers in comparison to the 107 systems.

SYSTEM PERFORMANCE By Investment Advisor;  
By Quarter

TABLE # 6A

\*\*\*\*\*

Investment Advisors	1987 Time-Weighted			1987 Quarterly Returns											
	Rank1 Rank2 Return			First			Second			Third			Fourth		
	Rank1	Rank2	Return	Rank1	Rank2	Return	Rank1	Rank2	Return	Rank1	Rank2	Return	Rank1	Rank2	Return
Prim Board	1	16	4.07	1	12	9.64	1	5	1.78	1	15	2.67	10	90	-9.17
Shawmut Bank	2	33	2.63	11	98	3.00	8	69	-1.02	10	95	-1.45	1	9	2.15
Bank of New England - West	3	38	2.35	9	92	3.44	6	44	-0.38	6	61	0.28	3	20	-0.95
David L. Babson	4	39	2.19	8	70	4.93	3	37	-0.09	7	65	0.23	5	38	-2.74
Boston Company	5	39	2.14	10	95	3.24	9	83	-1.55	8	68	0.06	2	15	0.44
Constitution Capital Management	6	39	2.13	7	65	5.21	2	25	0.20	5	56	0.49	7	46	-3.59
BayBank	7	50	1.66	4	41	6.42	7	69	-0.98	4	30	1.62	8	58	-5.06
Richard H. Morse	8	64	0.70	6	54	5.77	4	40	-0.25	2	25	1.99	9	69	-6.41
Alex, Brown and Sons	9	68	0.12	5	53	5.80	10	90	-2.23	9	69	0.04	6	43	-3.25
Tucker Anthony Management Co.	10	76	-0.66	3	35	6.92	11	90	-2.23	11	100	-3.19	4	31	-1.83
de Burlo Group	11	90	-2.28	2	25	8.41	5	41	-0.30	3	29	1.67	11	101	-11.07

\*\*\*\*NOTE: Rank1 denotes the ranking among the 11 managers.  
Rank2 denotes the ranking of the managers in comparison to the 107 systems.

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS  
INVESTMENT REPORT

SYSTEM PERFORMANCE By Investment Advisor;  
Annual; By Asset Class

TABLE # 6B

\*\*\*\*\*

Investment Advisors	# of Systems	1987 Time-Weighted			Equity			Allo-		cation
		Rank1	Rank2	Return	Rank1	Rank2	Return	Rank1	Rank2	
Prim Board	12	1	16	4.07	3	18	4.37	1	1	56.14%
Shawmut Bank	4	2	33	2.63	4	29	2.31	11	100	8.84%
Bank of New England - West	3	3	38	2.35	5	32	1.67	10	83	17.76%
David L. Babson	3	4	39	2.19	7	56	-2.37	8	75	19.32%
Boston Company	3	5	39	2.14	2	11	4.84	6	58	25.56%
Constitution Capital Management	6	6	39	2.13	8	58	-2.73	7	67	21.78%
BayBank	4	7	50	1.66	1	9	5.66	5	51	29.67%
Richard H. Morse	3	8	64	0.70	9	62	-4.69	4	46	30.97%
Alex, Brown and Sons	3	9	68	0.12	10	76	-9.09	9	76	19.24%
Tucker Anthony Management Co.	4	10	76	-0.66	6	45	-0.08	3	43	32.13%
de Burlo Group	11	11	90	-2.28	11	80	-9.60	2	25	42.35%

	Fixed Income					Allo-	Cash					Allo-
	Rank1	Rank2	Return	Rank1	Rank2		Rank1	Rank2	Return	Rank1	Rank2	
Prim Board	4	27	3.03	11	89	39.51%	8	59	6.86	11	96	4.35%
Shawmut Bank	8	57	1.85	1	19	71.46%	6	46	7.08	2	27	19.70%
Bank of New England - West	7	38	2.61	8	60	54.62%	3	41	7.19	1	14	27.62%
David L. Babson	3	24	3.45	3	26	67.97%	11	91	5.79	6	47	12.71%
Boston Company	5	33	2.76	2	26	68.43%	4	44	7.16	10	85	6.01%
Constitution Capital Management	6	33	2.76	5	34	65.17%	5	44	7.13	5	46	13.05%
BayBank	9	67	1.32	6	41	61.12%	1	39	7.33	8	60	9.21%
Richard H. Morse	2	17	3.96	7	46	58.70%	10	87	5.96	7	55	10.33%
Alex, Brown and Sons	10	79	0.13	4	31	66.15%	9	72	6.31	3	41	14.61%
Tucker Anthony Management Co.	11	100	-2.00	9	62	53.58%	2	40	7.23	4	43	14.29%
de Burlo Group	1	14	4.20	10	73	49.14%	7	48	7.04	9	65	8.51%

\*\*\*\*NOTE: Rank1 denotes the ranking among the 11 managers.  
Rank2 denotes the ranking of the managers in comparison to the 107 systems

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS  
INVESTMENT REPORT

SYSTEM PERFORMANCE By Investment Advisor;  
Annualized; By Asset Class

TABLE # 6C

\*\*\*\*\*

Investment Advisors	1985-1987 Annualized Time-Weighted			1985-1987 Annualized Equity			1985-1987 Annualized Fixed Income			1985-1987 Annualized Cash		
	Rank1	Rank2	Return	Rank1	Rank2	Return	Rank1	Rank2	Return	Rank1	Rank2	Return
Alex, Brown and Sons	3	35	12.73	8	51	17.32	10	65	12.31	7	60	7.40
Bank of New England - West	9	50	11.90	2	6	24.82	8	62	12.50	9	71	7.22
BayBank	2	30	12.96	7	29	19.75	5	47	13.24	1	21	8.66
Boston Company	7	40	12.28	1	6	26.61	9	63	12.40	6	55	7.55
Constitution Capital Management	4	35	12.71	10	58	16.44	4	47	13.29	4	33	8.06
David L. Babson	5	35	12.61	4	28	20.19	2	23	14.24	11	85	6.84
de Burlo Group	10	83	9.91	11	85	11.95	7	55	12.94	2	27	8.33
Prim Board	1	11	14.53	6	29	19.79	1	6	15.35	8	63	7.36
Richard H. Morse	11	87	9.64	9	52	16.91	11	72	11.60	10	77	7.04
Shawmut Bank	8	49	11.96	5	29	19.91	3	26	14.08	5	51	7.71
Tucker Anthony Management Co.	6	37	12.46	3	19	21.25	6	47	13.23	3	31	8.11

\*\*\*\*NOTE: Rank1 denotes the ranking among the 11 managers.  
Rank2 denotes the ranking of the managers in comparison to the 107 systems.

## SYSTEM PERFORMANCE BY INVESTMENT ADVISOR

### Table #6 Indicates:

The number of systems managed by each investment advisor managing three or more systems in 1987; the 1985-1987 annualized time-weighted rate of return aggregated for each investment advisor, the advisor's ranking and the ranking each investment advisor would receive if integrated with Table #1; the 1987 time-weighted rate of return for each investment advisor listed so that the advisor with the highest 1987 time-weighted rate of return is listed first and the advisor with the lowest 1987 time-weighted rate of return is listed last, the advisor's ranking and the ranking each investment advisor would receive if integrated with Table #1; and the December 31, 1987 market value of each investment advisor, the advisor's ranking and the ranking each investment advisor would receive if integrated with Table #1.

### Table #6A Indicates:

The 1987 time-weighted rate of return for each investment advisor listed so that the advisor with the highest 1987 time-weighted rate of return is listed first and the advisor with the lowest 1987 time-weighted rate of return is listed last, the advisor's ranking and the ranking each investment advisor would receive if integrated with Table #1; and quarterly investment returns for each investment advisor, the advisor's ranking and the ranking each investment advisor would receive if integrated with Table #2.

### Table # 6B Indicates:

The number of systems managed by each investment advisor; the 1987 time-weighted rate of return for each investment advisor so that the advisor with the highest 1987 time-weighted rate of return is listed first and the advisor with the lowest 1987 time-weighted rate of return is listed last, the advisor's ranking and the ranking each investment advisor would receive if integrated with Table #1; the annual return on the equity portion of the investment advisor's portfolio which includes common and preferred stock, the advisor's ranking and the ranking each investment advisor would receive if integrated with Table #3; the December 31, 1987 percentage of the investment advisor's portfolio invested in equities, the advisor's ranking and the ranking each investment advisor would receive if integrated with Table #3; the annual return on the fixed income portion of the investment advisor's portfolio which includes all fixed income securities and group annuity contracts/retirement plan funding agreements, the advisor's ranking and the ranking each investment advisor would receive if integrated with Table #3; the December 31, 1987 percentage of the investment advisor's portfolio committed to fixed income securities and group annuity contracts/retirement plan funding agreements, the advisor's ranking and the ranking each investment advisor would receive if integrated with Table #3; the annual return on cash which includes cash and cash equivalent investments, the advisor's ranking and the ranking each investment advisor would receive if integrated with Table #3; and the December 31, 1987 percentage of the investment advisor's portfolio committed to cash, the advisor's ranking and the ranking each investment advisor would receive if integrated with Table #3.

### Table # 6C Indicates:

The 1985-1987 annualized time-weighted rate of return aggregated for each investment advisor listed in alphabetical order, the advisor's ranking and the ranking each investment advisor would receive if integrated with Table #1; the annualized return on the equity portion of the investment advisor's portfolio which includes common and preferred stock, the advisor's ranking and the ranking each investment advisor would receive if integrated with Table #3A; the annualized return on the fixed income portion of the investment advisor's portfolio which includes all fixed income securities and group annuity contracts/retirement plan funding agreements, the advisor's ranking and the ranking each investment advisor would receive if integrated with Table #3A; and the annualized return on cash which includes cash and cash equivalent investments, the advisor's ranking and the ranking each investment advisor would receive if integrated with Table #3A.

We have aggregated performance by investment advisors for investment advisors managing three or more retirement systems. Appendix 3 contains systems included in the aggregate performance of each investment advisor. We have not shown performance for the investment advisors that manage assets of multiple advisor systems. Systems participating in the PRIT Fund have been included in the PRIM Board performance. The asset allocation for the PRIM Board reflects the actual asset allocation of the PRIT Fund. For 1987, the aggregate performance of all waived systems and participating systems in the PRIT Fund was .85% and the aggregate performance of all "legal list" systems was -1.34%.

## APPENDIX I

### Investment Advisor Footnotes (\*) and Multiple Advisor Listings

(\*) Those managers of systems who have qualified to manage under a "waiver" from the "legal list" restrictions are listed in Table #1. Four retirement systems who have not received waivers indicated on their annual statement the name of an investment advisor. Beverly, Maynard and Webster listed their investment manager as Alex Brown. The New Bedford Retirement System listed MacKay Shields Financial Corporation as its investment manager.

Berkshire County	(*) The systems purchased shares of the PRIT Fund on February 23, 1987.
Boston	Multiple Advisors Avatar Associates Bear Stearns, Inc. Boston Company Capital Bank Eagle Asset Mgmt. Thorndike, Doran, Paine & Lewis Oechsle International Advisors Warburg Investment Mgmt. International Ltd.
Braintree	(*) The system received its original "legal list" waiver on April 1, 1985 with the Shawmut Bank of Boston as investment advisor. On September 9, 1986 the system changed its investment advisor. Drexel Burnham Lambert has served Braintree as investment advisor since September 9, 1986.
Bristol County	Multiple Advisors de Burlo Group BayBank
Cambridge	(*) The system received a partial waiver on May 19, 1988 with APT Financial Services as real estate advisor.
Chelsea	(*) The system received its "legal list" waiver on March 4, 1987 with Keystone Investment Management Corporation as investment advisor. In April 1988 Chelsea withdrew its waiver and is now investing under the "legal list" standard.
Chicopee	Multiple Advisors Tucker Anthony Management Corp. Leonard Management Group
Clinton	(*) In its 1986 annual statement Clinton listed Alex Brown as investment advisor. Its 1987 annual statement does not list an investment advisor.
Concord	Multiple Advisors Constitution Capital Management Frank Russell Trust Company
Danvers	(*) The system purchased shares of the PRIT Fund on August 18, 1987.
Dedham	(*) In its 1986 and 1987 annual statement Dedham listed Aetna as its investment advisor. On June 1, 1988 Dedham transferred into the PRIT Fund.
Framingham	(*) The system purchased shares of the PRIT Fund on November 28, 1986.
Franklin County	(*) The system received its original "legal list" waiver on December 2, 1985 with the de Burlo Group as investment advisor. The waiver was revoked on January 27, 1988 when the system terminated its investment advisor. A new waiver was granted on March 31, 1988 with Tucker Anthony Management Corp. as investment advisor.
Gardner	(*) The system received a "legal list" waiver on May 21, 1985 with the Shawmut Bank of Boston as investment advisor. On December 1, 1986 Gardner transferred into the PRIT Fund.
Greenfield	(*) The system purchased shares of the PRIT Fund on February 25, 1987.
Hampden County	(*) The system received its original "legal list" waiver on April 11, 1985 with Rollert & Sullivan as its investment advisor. The waiver was revoked on July 31, 1985 when the system terminated its investment advisor. A new waiver was granted on August 16, 1985 with the Boston Company as investment advisor.

Hingham	(*) The system purchased shares of the PRIT Fund on May 1, 1986.
Holyoke	Multiple Advisors      Tucker Anthony Management Corp. David L. Babson Company Leonard Management Group A waiver granted to Holyoke on December 6, 1985 with Ray Depelteau as investment advisor was withdrawn in January 1988 when Mr. Depelteau left the retirement system.
Lowell	(*) The system received a "legal list" waiver on June 6, 1985 with BayBank as investment advisor. The waiver was revoked on November 13, 1985 when the system terminated its investment advisor. Lowell is now investing under the "legal list" standard. The system purchased shares of the PRIT Fund on July 10, 1987.
Methuen	(*) The system purchased shares of the PRIT Fund on April 1, 1988.
Middlesex County	Multiple Advisors      Boston Company Constitution Capital Management Oppenheimer Capital Putnam Advisory Company
Montague	(*) The system received a "legal list" waiver on March 5, 1986 with Gardner & Preston Moss, Inc. as investment advisor. On July 1, 1986 Montague transferred into the PRIT Fund.
Needham	(*) The system received a "legal list" waiver on March 12, 1985 with Fort Hill as investment advisor. On July 1, 1985 Needham transferred into the PRIT Fund.
New Bedford	(*) The system received its original "legal list" waiver on August 2, 1985 with Shawmut/Bristol County as investment advisor. On October 9, 1986 New Bedford withdrew its waiver and is now investing under the "legal list" standard.
Newton	(*) The system received its original "legal list" waiver on March 4, 1985 with Standish, Ayer & Wood as investment advisor. On March 19, 1987 Newton changed its investment advisor to the following investment advisors: Multiple Advisors      Boston Company Drexel Burnham Lambert Loomis, Sayles & Company Tucker Anthony Management Corp.
Northbridge	(*) The system received its original "legal list" waiver on April 4, 1985 with Shawmut/Worcester County as investment advisor. In January 1988 Northbridge transferred into the PRIT Fund.
Norwood	(*) The system purchased shares of the PRIT Fund on August 13, 1987.
Pittsfield	(*) The waiver granted the system on December 11, 1986 with Lawrence Grizey as investment advisor was withdrawn on January 15, 1988 with the retirement of Mr. Grizey. The de Burlo Group serves as investment advisor.
Plymouth County	(*) The system received a partial waiver from the "legal list" restrictions allowing 50% of the portfolio to be invested under a "prudent person" standard rather than under the "legal list" limitations.
Reading	(*) The system received its original "legal list" waiver on June 30, 1985 with the de Burlo Group as its investment advisor. Reading transferred into the PRIT Fund on June 1, 1988.
Revere	(*) The system received a partial waiver from the "legal list" restrictions on May 14, 1985 with Fort Hill as investment advisor. On March 27, 1987 Revere received a full waiver with Fort Hill continuing as their investment advisor.
Shrewsbury	(*) The system received a "legal list" waiver on February 12, 1985 with BayBank as the system's investment advisor. On July 1, 1985 Shrewsbury transferred into the PRIT Fund.

Somerville (\*) In its 1986 annual statement Somerville listed Alex Brown as investment advisor. Its 1987 annual statement does not list an investment advisor.

Springfield (\*) The system received its original "legal list" waiver on May 6, 1985 with the Bank of New England - West as investment advisor. Springfield changed its investment advisor and a new waiver was granted on October 13, 1987 with BayBank as investment advisor.

Worcester Multiple Advisors Bank of New England - Worcester  
Frank Russell Trust Company  
Mechanics Bank  
Trident Investment Management

(\*) The system purchased shares of the PRIT Fund on December 30, 1986.

The State Employees' and Teachers' Retirement Systems hold units in two trusts managed by the State Investment Committee: the Treasurer's Management Trust (TMT) for equities and the Treasurer's Fixed Income Securities Trust (TFIST) for fixed income investments. The advisors for the respective trusts are as follows:

TMT	Multiple Advisors	Capital Guardian Trust Co. Constitution Capital Management Eaton Vance Management Gardner & Preston Moss Hagler Mastrovita & Hewitt Independence Investment Associates Investco Capital Management Keystone Investment Management Corp. Manufacturers Life Insurance Co. Mass Financial Services One Federal Asset Management Scudder, Stevens & Clark Standish, Ayer & Wood State Street Bank State Street Research & Management Thorndike, Doran, Paine & Lewis Trinity Investment Management Wellington International Investors
	Real Estate	Aldrich Eastman & Walch/State Street Bank Real Estate Fund Copley Real Estate Advisors, Inc. First Chicago Investment Advisors John Hancock Realty Income Fund Lendorff & Babson Public Storage Sierra Capital
	Venture Capital/LBO	Beta Ventures, Inc. Clayton & Dubilier Associates Frontenac Venture Co. John Hancock Venture Capital Management Narragansett Capital, Inc. New Enterprise Associates Prudential Venture Capital TA Associates Vista Ventures Welsh, Carson, Anderson & Stowe
TFIST	Multiple Advisors	Delphi Capital Preservation Fiduciary Trust Company International Gardner & Preston Moss Loomis, Sayles & Co., Inc. Miller Anderson Scerrerd Pacific Investment Management Company Pension Investment Division of the State Treasury Standish, Ayer & Wood WR Lazard & Co., Inc.

PRIM Board

Multiple Advisors

Alliance Capital  
 Baring America  
 Baring International  
 Bear Stearns  
 Boston Company  
 Lazard Freres  
 Lehman Management Co., Inc.  
 N.M. Rothschild  
 One Federal Asset Management  
 Putnam Advisory Company  
 Sass Investors  
 Schroeder Capital Management  
 Scudder, Stevens & Clark  
 State Street International  
 Trinity  
 U.S. Trust  
 Warburg Investment  
 Internal - PRIM Staff

Real Estate

American Investment Team  
 Aldrich Eastman & Waltch  
 Bank of Boston  
 Boston Financial Group  
 Cabot, Cabot & Forbes  
 Copley Real Estate Advisors  
 Heitman Advisory Corp.  
 J.M.B. Institutional Realty Corp.  
 John Hancock Property Investors Corp.  
 Lomas & Nettleton  
 Massachusetts Mutual  
 Trust Company of the West

Venture Capital

Advent International Network Fund  
 APA Ventures III  
 Davis Venture Partners  
 Forstmann Little  
 Golder, Thoma & Cressey  
 John Hancock Venture Capital Management, Inc.  
 Kohlberg, Kravis & Roberts  
 Smith Offshore  
 Southern California Ventures  
 Venture Capital Fund of New England  
 Vista III Limited Partnership  
 Weintraub Entertainment Group

As of July 1, 1988

70 systems	Are investing pursuant to a "legal list" waiver from PERA.
2 systems	Are investing pursuant to a statutory "legal list" waiver (State Employees' and Teachers' Systems).
15 systems	Are participating in PRIT.
3 systems	Were waived at one time but now are investing with "legal list" restrictions.
16 systems	Continue investing on the "legal list" standard.



APPENDIX 2

Investment Advisors Managing Multiple Systems

<u>Investment Advisor</u>	<u>Number of Systems Managing</u>	<u>Systems Under Management</u>
PRIM Board	15	Dedham, Fairhaven, Gardner, MHFA, Milton, Minuteman, Montague, Needham, Norfolk County, Northbridge, Reading, Saugus, Shrewsbury, Wakefield, Weymouth
de Burlo Group	9	Belmont, Bristol County, Lynn, Malden, Marblehead, North Adams, Northampton, Pittsfield, Swampscott
Constitution Capital Mgmt.	8	Arlington, Concord, Hingham, Medford, Melrose, Middlesex County, Norwood, Winthrop
Tucker Anthony Mgmt Corp.	8	Chicopee, Essex County, Franklin County, Gloucester, Holyoke, Marlborough, Newton, Peabody
Boston Company	7	Boston, Hampden County, Haverhill, MWRA, Middlesex County, Newton, Watertown
BayBank Inc.	6	Attleboro, Bristol County, Everett, Fall River, Springfield, Waltham
David L. Babson	5	Blue Hills, Holyoke, Methuen, Stoneham, Woburn
Shawmut Bank	3	Athol, Salem, West Springfield
Bank of New England - West	3	Greenfield, Hampshire County, Westfield
Richard H. Morse	3	Amesbury, Danvers, Newburyport
Fort Hill	3	Brockton, Hull, Revere
Alex Brown	3	Beverly, Maynard, Webster

### APPENDIX 3

The systems included in the aggregate performance of each investment advisor are as follows:

Alex, Brown and Sons	Beverly, Clinton, Maynard, Somerville, and Webster for 1985 and 1986; Beverly, Maynard, and Webster for 1987.
David L. Babson	Blue Hills and Stoneham for 1985; Blue Hills, Methuen, and Stoneham for 1986 and 1987.
Bank of New England - West	Hampshire County, Springfield, and Westfield for 1985; Greenfield, Hampshire County, Springfield, and Westfield for 1986; Greenfield, Hampshire County, and Westfield for 1987.
BayBank	Attleboro, Everett, Fall River, and Waltham.
The Boston Company	Hampden County, Haverhill, and Watertown.
Constitution Capital Management	Arlington, Medford, Melrose, Middlesex County, Norwood, and Winthrop for 1985; Arlington, Medford, Melrose, Norwood, and Winthrop for 1986; Arlington, Hingham, Medford, Melrose, Norwood, and Winthrop for 1987.
de Burio Group	Belmont, Bristol County, Franklin County, Lynn, Malden, Marblehead, North Adams, Northampton, Reading, and Swampscott for 1985 and 1986; Belmont, Bristol County, Franklin County, Lynn, Malden, Marblehead, North Adams, Northampton, Pittsfield, Reading, and Swampscott for 1987.
PRIM Board	Minuteman, Needham, Norfolk County, Shrewsbury, Wakefield, and Weymouth for 1985; Fairhaven, Gardner, Milton, Minuteman, Montague, Needham, Norfolk County, Saugus, Shrewsbury, Wakefield, and Weymouth for 1986; Fairhaven, Gardner, MHFA, Milton, Minuteman, Montague, Needham, Norfolk County, Saugus, Shrewsbury, Wakefield, and Weymouth for 1987.
Richard H. Morse	Amesbury, Danvers, and Newburyport.
Shawmut Bank	Athol, Braintree, Gardner, New Bedford, Northbridge, and Salem for 1985; Athol Northbridge, Salem, and West Springfield for 1986 and 1987.
Tucker Anthony Mgmt. Co.	Essex County, Gloucester, and Peabody for 1985; Chicopee, Essex County, Gloucester, and Peabody for 1986 and 1987.

## MARKET REVIEW

The year 1987 was a historic one for the world's financial markets. The Dow Jones Industrial Average (DJIA) finished the year on an optimistic note, with market values up 2.26%. In the beginning of the year, the market's dramatic gains sent waves of euphoria throughout the Wall Street community. Then came "black Monday" on October 19th. The DJIA plunge of 508 points sent a flood of panic and depressionary fears throughout the world. However, as the rest of the year unfolded, it was clear that the short-term impact of the stock market debacle did not precipitate recessionary economic activity. In fact, it can be proven from the economic data that the economy continued its expansionary phase through the remainder of 1987. To understand the developments in the financial markets one must analyze the economy as a whole for 1987.

For the first half of 1987, the GNP grew at an annual rate of 3.45%. Unemployment fell to 6.1%, the lowest rate in 7 1/2 years. The budget deficit was reported to be \$121.93 billion at the end of the first half of the fiscal year, down by \$15 billion from the first half of fiscal 1986. The merchandise trade deficit grew to \$78.2 billion for the first half of calendar year 1987. Both deficits put downward pressure on the U.S. dollar. The U.S. banking industry raised the prime rate to 7 3/4% from 7 1/2% (December 31, 1986) in April 1987.

As the level of interest rates began to rise, the bond market retreated to levels not seen since the fall of 1986. The yields on the 30-year Treasury bonds increased to 9.0% in April, up from 7.5% in January, only to fall to 8.4% by the end of June. Short-term rates, as measured by the U.S. 90-day Treasury bill, were stable, ending the first half of the year at 5.7%, the same level as at the end of 1986.

The stock market experienced record gains for the first half of the year. After the first 13 trading days of the year, the DJIA stood 208.52 points higher than the final trading day of the previous year, an 11% increase. For the first quarter, the Standard & Poor's 500 Stock Index soared a remarkable 21.34%, including dividends, while the DJIA rose an incredible 408 points. A factor influencing this sharp surge in the stock market was large inflows of foreign capital into the U.S. equity markets. Foreign institutional investors purchased U.S. equities at an annual rate of \$34 billion. The new tax law eliminated the capital gains deduction in 1987 and as a result, in December 1986, there was a tremendous amount of tax-related selling in order to capture the capital gains deduction. This left an increased amount of liquidity in the economy which was injected into the stock market. The stock market experienced a roller-coaster effect for the second quarter of 1987. The market's volatility led to only a 5% total increase in the S&P 500 Index for the second quarter, however, it was up 27.41% for the first half of the year. The DJIA posted an increase of 113.85 points.

The first half of 1987 was a turning point for the five-year bull market. The bull market began on August 11, 1982, and since that time had been driven by the substantial decrease in interest rates. The bond market and the stock market moved in tandem. However, in the early part of 1987, there was a divergence between the two markets. Interest rates were rising and the bond market was falling but the stock market was reaching new highs. A phenomenon had occurred in that the stock market had transformed from an interest-rate-driven market to an earnings-driven market.

For the second half of 1987, the GNP grew at an annual rate of 4.5%, and an actual rate of 4.0% for all of 1987. Unemployment fell to 5.9% by year end, the lowest rate in 13 years. At the end of the fiscal year 1987, the federal budget deficit was \$148.01 billion, down by \$73.13 billion from fiscal year-end 1986. Despite the reduction in the budget deficit, the merchandise trade deficit grew to a net \$159.2 billion at the end of 1987, up from \$144.34 billion in 1986. Merchandise trade exports increased by 11.8% to \$250.81 billion while imports increased 11.2% to \$410.02 billion. The U.S. dollar continued its slide in the last six months of 1987.

In October, in conjunction with a discount rate hike, the nation's prime rate was raised to 9 1/4%, the highest level for 1987. In reaction to the Federal Reserve tightening its credit policy, and a weakening dollar, yields on most debt issues reached their highest levels in 19 months. The U.S. 90-day Treasury bill ended the third quarter yielding 6.6%. After the stock

market crash, the Federal Reserve injected liquidity into the credit markets. Three weeks later, the long-term Treasury yield fell to 8 3/4%. In an attempt to alleviate recessionary fears, U.S. banks cut the prime rate to 8.75% by the end of the year. The long-term Treasury closed out 1987 yielding 8.98%.

When the bull stock market reached its fifth year anniversary in August of 1987, the DJIA stood with a gain of over 241% (August 1982 to August 1987) and 42% for 1987. In the first two months of the third quarter, the DJIA surpassed three century marks - 2500, 2600 and 2700. On August 25th, the market reached an all time high of 2722.42. In the third quarter, there were two major factors which initiated this propulsion of the stock market to new highs. The first factor was the excessive liquidity in both the domestic and international economies. Institutional investors had tremendous amounts of cash reserves and capitalized on small pullbacks in the market by purchasing prodigious amounts of equities, catapulting the U.S. market to record levels. The second factor driving this market was the individual investors' psychological fears that they were missing out on the current bull market. As the third quarter came to an end, the market reacted in a negative manner to the rising interest rates, plummeting bond market, falling dollar, and the trade and budget deficits. Worries over these factors ignited waves of selling in October, climaxing on October 19th. In one day, the DJIA plummeted 508 points (22.6%) to 1738.74 on volume of 604.3 million shares, erasing all of 1987's gains. Index arbitrage-related computer program trading was blamed for being a major factor in exacerbating the market plunge. On October 19, institutional investors were net buyers while retail investors were net sellers. From August 25 to October 19 the DJIA fell 36.1%.

In the days following the crash, the Federal Reserve shifted monetary policy to anti-recession and away from anti-inflation to stabilize the economy and the financial markets in fear of a total collapse of the economic structure. On October 20 and 21, the DJIA rebounded over 200 points or 12%. The stock market as measured by the DJIA ended 1987 at 1938.83, up 42.88 points (2.3%). The S&P 500 Index closed out 1987 with a price and dividend return of 5.2%. The broader markets fared even worse than the DJIA. The NASDAQ Composite Index finished the year down 5.26% while the American Stock Exchange Composite Index closed off 1.11%.

Equity returns as categorized by industry varied greatly in 1987. Despite the stock market's disappointing performance, there were several industries with positive changes in their market value. The steel industry had the largest increase in total market value, an average increase of 69%. The metals and mining industry's market value increased by 63%, on a 242% rise in earnings for 1987. The third best performing industry group, the semiconductor manufacturers, had a change in market value of 39%. Two of the worst industries for 1987 were banks & bank holding companies and savings & loans. The banking industry's market value fell, on average, 16% for the year. The Keefe, Bruyette & Woods Inc. Index (an index for money center banks) ended the year with a total return of -13.88%. Earnings for the bank and bank holding companies were negative for 1987, reflecting losses on third world loans. The saving and loans' earnings were even worse relative to bank and bank holding companies' earnings. Savings & loans' industry average market value declined an average of 30%. The poor performance for the savings & loans was a result of defaulted loans made in the U.S. energy sector and the agricultural sector.

Nineteen eighty-seven was a historic year with record highs and lows being set. Even with "Black Monday", the stock market resulted in a positive gain for 1987. In fact, stocks were a better investment for the year as compared to bonds. When taking the 2.3% positive return for the year, an average dividend return of 4%, minus the rate of inflation of 4.4% (increase in the Consumer Price Index), stocks had a small real rate of return of 1% to 2%. This return is very small compared to other years in the stock market. Long-term bonds did not fare as well as stocks. When considering the price, adding the interest and subtracting inflation, the real rate of return for long-term bonds was -3% to -5%. According to Morgan Guaranty Trust Co., volatility in the 30-year Treasury bond and corporate bond markets now is twice as high as a decade ago.

(SOURCES: THE WALL STREET JOURNAL; ECONOMIC REPORT OF THE PRESIDENT February, 1987; BUSINESS ALMANAC 1987; TIME; BUSINESSWEEK; BENEFITS QUARTERLY; PROSPECTS FOR FINANCIAL MARKETS IN 1988 (Salomon Brothers Inc.); KEYSTONE INVESTMENT MANAGEMENT CORP. Quarterly Investment Commentary, January, 1988; Wright Investors' Service; Facts on File News Reference Service.)

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